



PROJECT MANUAL for KEMPER STATION BIKE/HIKE TRAIL

98096-M
[EN97-118-113,C-502]

PREBID CONFERENCE:
Thursday, March 10, 2005 @ 10:00 a.m.

BIDS DUE:
Thursday, March 24, 2005 at 3:00 p.m.

January, 2005



City of Lynchburg
Office of Economic Development
828 Main Street, 10th Floor
Lynchburg, Virginia 24504
(434)455-4493 -- phone
(434) 847-2067 -- fax
Contact: Mary Jane Russell

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SECTION 00015 -- LIST OF CONTRACT DRAWINGS

<u>Sheet Number</u>	<u>Title</u>
1	Title Sheet
1A	Master Plan
2	Trail -- Typical Section and Details Sheet
C-3	Kemper Station Trail Plan and Profile Sheet Sta. 99+00 to Sta. 109+50
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8X	Kemper Station Trail Cross-Sections Sta. 124+00 to Sta. 134+00

ADVERTISEMENT FOR BIDS

The City of Lynchburg will receive sealed bids in the Procurement Division Office, 900 Church Street, Third Floor City Hall, Lynchburg, VA for the KEMPER STATION BIKE/HIKE TRAIL until 3:00 p.m. local prevailing time, Thursday, March 24, 2005. Bids will then be publicly opened and read.

The project consists of all labor and materials required for construction of 5,787 l.f. asphalt bike/hike trail. The contract shall be a unit price contract with award determined by the lowest responsible base bid submitted according to the estimated unit quantities on the bid form.

Bid Documents consisting of Project Manual and Drawings are available on line at www.lynchburgva.gov and will be open to the public for inspection at the following locations: Economic Development office, 828 Main Street, 10th Floor, Lynchburg, VA; Valley Construction News, 428 W. Campbell Avenue, Roanoke, VA 24016; P.O. Box 791, Roanoke, V A 24004; Dodge Plan Room, Colonnade Corporate Center, Building A, Suite 102, 2840 Electric Road SW, Roanoke, VA 24018; Builders Exchange, Richmond, VA; Construction Market Data, Richmond, VA.

Copies of the Bid Documents may be obtained from the Office of Economic Development, 828 Main Street, 10th Floor, Lynchburg, VA. 24504, upon payment of a non-refundable check or money order in the amount of \$30 for each set. Only complete sets will be issued. Send payments to the above address to the attention of Mary Jane Russell and indicate if sender is general contractor or other than general contractor. Include complete street address with zip code for use by express delivery agencies as well as complete mailing address with zip code to avoid delay in receiving transmittals. Include telephone number and fax number with the area code.

A Prebid Conference will be conducted at 10:00 a.m. on Thursday, March 10, 2005 at the Kemper Station Community Room, 825 Kemper Street. Attendance at this meeting is recommended for all potential bidders. All clarifications or additional information must be made in writing to V. Eloise Bowling, CPPB, Senior Buyer, Procurement Division, by facsimile (434) 845-0711 or e-mail Eloise.bowling@lynchburgva.gov, by March 17, 2005.

Bids shall be accompanied by a certified check or an acceptable bid bond in the amount of five percent (5%) of the base bid. Bidders must be licensed as contractors in the Commonwealth of Virginia in accordance with the Code of Virginia. The successful bidder shall be required to provide bonds and insurance as set forth in the Project Manual.

Bids may be withdrawn in accordance with the Virginia Public Procurement Act (VPP A), Section 2.2-4330, Procedure (1). Bidders are required to comply with Chapter 11, Title 54.1, Code of Virginia (1950) as amended, and meet the requirements of the Virginia Public Procurement Act (VPP A) Title 2.2 Chapter 43, Paragraph 2.2-4311, Employment discrimination prohibitions and 2.2-4312, Drug free workplace. Each bid bidder shall place over his signature on the bid proposal and the outside of the envelope containing his bid one of the following notations: "Registered Virginia Contractor No-

The City of Lynchburg is an Equal Opportunity Employee and strongly urges Women Owned and Minority businesses to apply.

Advertise Sunday February 27, 2005

SECTION 00100 -- INSTRUCTIONS TO BIDDERS

1. General: This project consists of all labor, materials, equipment, services, and performance of all work required for construction of 5,787 l.f. asphalt **Kemper Station Bike/Hike Trail**. To be valid for consideration, bids must be completed and submitted in accordance with these instructions to bidders. All individual bid unit price items must be filled in regardless of the quantity shown.
2. Bidding documents will be provided as indicated in the Advertisement.
3. Qualification of Bidders: Each bidder who submits a bid is in fact certifying that he is qualified in all respects to perform the work according to the terms of the contract and as described herein. Bidders may be asked to submit financial data, previous experience, and evidence of authority to conduct business in the jurisdiction where the project is located. Contractor shall be licensed in the Commonwealth of Virginia in accordance with Title 54.1, Chapter 11, Code of Virginia (1950) as amended.
4. Examination of Bid Documents and Site:
 - 4.1 Before submitting bids, each bidder must examine bid documents thoroughly; familiarize themselves with Federal, State and local laws, ordinances, rules, and regulations affecting the work; and correlate their observations with requirements of the bid documents.
 - 4.2 Bidders are requested and expected to visit the site of the project to alert themselves to local and special conditions which may be encountered during construction of the project such as: Labor and transportation, handling and storage of materials, the availability of materials, and site access. Failure to make such investigations shall not relieve the successful bidder from performing and completing the work in accordance with the contract documents.
 - a. A pre-bid conference will be held at the time and place stated in the Advertisement.
 - 4.3 Specifications: The term specifications shall refer to the Project Manual for **Kemper Station Bike/Hike Trail** which includes sections from The City of Lynchburg Manual of Specifications and Standard Details, current printing; General Conditions contained herein; and applicable sections of current VDOT Road and Bridge Standards, Road and Bridge Specifications, and Work Area Protection Manual.

5. Interpretations:

- 5.1 No oral interpretations of the bid documents will be made to any bidder. To be given consideration, requests for interpretations must be received in time to allow preparation of written response at least five days prior to date fixed for opening of bids—requests will not be considered if made after 5:00 p.m., Thursday, March 17, 2005. Interpretations will be issued in the form of written addenda to the bid documents and mailed or faxed to all parties who previously received bid documents, prior to scheduled opening of bids. Only interpretations by formal written addenda will be binding.
- 5.2 All communications in regard to interpretations and any other matters related to this project shall be addressed in writing to: Eloise Bowling, Senior Buyer, Procurement Division Office, 900 Church Street, Third Floor City Hall, Lynchburg, VA 24504, phone 434-455-3961; fax 434-845-0711; e-mail eloise.bowling@lynchburgva.gov.

6. Substitutions:

- 6.1 Substitutions of material or equipment or both may be offered by the Bidder with his bid, provided that, if approved:
 - a. No major changes in the construction or design intent of the project would be required. Changes required to accommodate substituted items shall be made by the successful Contractor at no additional cost or time delay.
 - b. Features of quality, capacity, construction, performance, appearance, size, arrangement, and general utility including economy of operation of substitutes offered, either parallel or exceed those of specified products.
 - c. The provisions of 01000 General Requirements and any other guarantees, if required by the specification sections, shall apply in full force and effect to the performance of such substitute products, approved for incorporation into the Work.
- 6.2 Technical data covering the proposed substitution shall be furnished with the bid.
- 6.3 City reserves the right in its sole discretion to accept or reject any or all substitutions.

7. Bid Submission:

- 7.1 Submit bids using forms furnished in the Project Manual or duplicate copies of these forms, ensure that all blank spaces on the form are filled in correctly. Repeat notation "Contractor's Current Virginia License No. _____ " on

outside of inner envelope containing bid and bid security, and place this envelope within another envelope addressed to:

City of Lynchburg
Eloise Bowling
Procurement Division
900 Church Street
Third Floor City Hall
Lynchburg, VA 24504

- 7.2 Both the inner and outer envelopes shall have noted thereon:
- a. Bid for the Construction of the **Kemper Station Bike/Hike Trail**.
 - b. The bidder's name and address.
- 7.3 Bid security shall be provided as stated in the Advertisement. Attorney-in-Fact who signs bid bond must file with such bond a certified copy of their Power-of-Attorney to sign such bonds.
- 7.4 Receipt deadline for bids will be as stated in the Advertisement.
- a. No bidder shall withdraw, modify, or cancel any part of his bid for the number of days stated on the Bid Form following this date and time except as provided by Virginia Public Procurement Act (VPPA), Section 2.2-4330, Procedure (1).
- 7.5 Bids will be opened publicly in accordance with Advertisement.
- 7.6 It is the Bidder's responsibility to assure bid is received prior to closing time for receipt of bids.
- 7.7 Withdrawal of bids after date for submission: In accordance with Procedure (1) of Section 2.2-4330 of the Virginia Public Procurement Act (VPPA), a bidder will have two business days after the opening of bids within which to claim, in writing, any mistake as defined in said Section and withdraw his bid, provided such mistake be proved from the Contractor's work papers.
- a. Definition: Contractor's work papers are the original work papers, documents, and materials used in the preparation of the bid as referred to in Section 2.2-4330 of the VPPA.
- 7.8 Appeals Procedure: In accordance with Article 4—Remedies of the Lynchburg Code, any bidder, offeror or contractor may protest a decision to award on an award; appeal a decision to refuse to allow withdrawal of bids; appeal a decision

of disqualification, decision of debarment, or a determination of non-responsibility; or appeal a decision on disputes arising during the performance of a contract.

- A. Any bidder or offeror who desires to protest the award or decision to award a contract shall submit such protest in writing to the purchasing agent no later than ten days after notice of the award or decision to award is posted, whichever occurs first. Any potential bidder or offeror on a contract negotiated on a sole source or emergency basis who desires to protest the award or decision to award such contract shall submit such protest in the same manner no later than ten days after posting of the notice of such award. No protest shall lie for a claim that the selected bidder or offeror is not a responsible bidder or offeror. The written protest shall include the basis for the protest and the relief sought. The purchasing agent or designated official shall issue a decision in writing within ten days stating the reasons for the action taken. This decision shall be final unless the bidder or offeror appeals within ten days of the written decision by appealing to the Lynchburg Circuit Court as provided in Sections 4-8 of this policy.
- B. If prior to an award it is determined that the decision to award is arbitrary or capricious, then the sole relief shall be a finding to that effect. The purchasing agent shall then either cancel the proposed award or revise it to comply with the law. Where the award has been made but performance has not begun, the performance of the contract may be enjoined. Where the award has been made and performance has begun, the purchasing agent may declare the contract void upon a finding that this action is in the best interest of the public. Where a contract is declared void, the performing contractor shall be compensated for the cost of performance up to the time of such declaration. In no event shall the performing contractor be entitled to lost profits.
- C. Where the purchasing agent determines that there is probable cause to believe that a decision to award was based on fraud or corruption or on an act in violation of Article 5 of this policy, the purchasing agent may enjoin the award of the contract to a particular bidder or offeror.

8. Bonds and Damages:

- 8.1 Bonds shall be with a surety company acceptable to the Owner.
- 8.2 A Performance Bond and a Labor and Material Payment bond will be required in the amount of 100 percent of the bid.
- 8.3 Liquidated damages shall be paid as indicated in the Construction Agreement.

9. Award of Contract:

- 9.1 The contract will be a unit price contract with award determined by the lowest responsible base bid submitted according to the estimated unit quantities on the bid form and whose bid meets the prescribed requirements.
- 9.2 Before the contract is awarded, the Contractor submitting the lowest bid must satisfy the City that they have the requisite organization, capital, equipment, ability, personnel, subcontractors, and at least five years experience in the type work for which they have submitted a bid. Each bidder shall, with his bid, submit a list of at least five projects of similar size and dollar value completed within the last five years, giving location, dollar value, year completed, and the name(s) of the Owner(s) and Engineer(s)/Architect(s). Each Contractor shall verify to the Owner that they have sufficient and qualified personnel to provide for the contact work and have the ability to provide the necessary materials and equipment on an emergency basis during non-regular hours. Failure by the any bidder to provide sufficient evidence to satisfy the Owner on their ability to meet any of the above requirements will serve as grounds for rejection of the bid.
- 9.3 The Owner reserves the right to reject any and all bids and waive any and all informalities and the right to disregard all conforming or conditional bids or counterproposals.
- 9.4 The project has a base bid and alternate bid items. The Owner reserves the right to delete or include alternate bid items to remain within the available budgeted funds for the project.
- 9.5 Qualifications: Bidders shall complete the Qualifications Report attached to the Bid Form.
- 9.6 Equal Opportunity Employment: Bidders shall complete the Equal Opportunity Report Statement attached to the Bid Form, and comply with Code of Virginia Section 11-51.
- 9.7 Anti-Collusion Statement: Bidders shall complete the Anti-Collusion Statement attached to the Bid Form. Failure to sign and notarize this statement may result in rejection of the bid.
- 9.8 Submission of post-bid information shall include but not be limited to: construction schedule, work sequencing, and sub-contractor list.

10. Federal Requirements:

- 10.1 Due to the participation of the Federal Government in funding this project, there are certain Federal clauses included as part of the Bid Documents, refer to

Appendices A-F. The Federal government will not be a party to the contract but as a condition to receiving and expending Federal funds, all provisions and clauses must be adhered to.

11. Disadvantaged Business Enterprise Plan:

- 11.1 It is the policy of the City of Lynchburg to utilize Disadvantaged Business Enterprises wherever possible in contracting. This commitment can be demonstrated by the efforts taken in the development of this plan and in correspondence within this organization stating such position.
- 11.2 The following procedures will be utilized by the City of Lynchburg to obtain Disadvantaged Business Enterprise participation: Advertise 30 days before bids or proposals are requested. It should be noted that some projects may be advertised less than 30 days due to certain circumstances. Provide written notice to DBE's that their interest in a proposed contract is solicited, with invitation to attend pre-bid meeting. Maintain a list of DBE's to be contacted.
- 11.3 The following person has been assigned the responsibility to manage and implement the DBE Program:
 - Ms. Melva Walker
 - Administrative and Grants Coordinator
 - City Hall, Dept. of Community Planning and Development
 - 434-455-3916
- 11.4 An up-to-date DBE Directory is available from the Dept. of Community Planning and Development and will be provided to all bidders and proposers upon request.
- 11.5 Selection of successful project contractors will include a consideration of cost and evidence that the competitor has conscientiously attempted to employ DBE's. A requirement of the contract agreement will be that a genuine concerted effort shall be made to utilize DBE's whenever possible as listed on the Equal Opportunity Report Statement. Failure to document and submit DBE contacts on the Equal Opportunity Report Statement will be a basis for rejection of the bid as non-conforming.

12. Employment Discrimination by Contractor Prohibited:

- 12.1 During the performance of this contract, the contractor agrees as follows:
 - 1. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin, except where religion, sex, or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the contract. The contractor will not discriminate against and will make reasonable

efforts to accommodate disabled persons as required by the Americans with Disabilities Act. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of the nondiscrimination clause.

2. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
3. Notices, advertisements, and solicitations placed in accordance with Federal Law, rules, or regulations shall be deemed sufficient for the purpose of meeting the requirements of this Section.

12.2 The contractor will include the provisions of the foregoing paragraphs in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

13. Time of Completion:

13.1 Successful Contractor agrees to commence work within 10 consecutive calendar days of the date of the written "Notice to Proceed" of the Owner and to fully complete the project within 159 calendar days thereafter. The Owner intends to give the Intent-of-Award on April 13, 2005 and the Notice-to-Proceed on April 25, 2005, but reserves the right to move the dates, if necessary.

13.2 The successful Contractor shall pay liquidated damages in the sum of \$350 for each consecutive calendar day that the terms of the contract are unfulfilled to the satisfaction and acceptance of the Owner.

13.3 Contract time for the complete site shall be adjusted on a day-for-day basis for approved suspension of work due to inclement weather.

13.4 Progress shall be closely monitored. If the successful Contractor falls significantly behind the schedule as provided, the Owner reserves the right to halt construction and cancel the contract with any costs incurred by the Owner in replacing the contractor deducted from the contractor's contract bond.

SECTION – 00310 -- BID FORM

City of Lynchburg
Eloise Bowling
Procurement Division Office
900 Church Street
Third Floor City Hall
Lynchburg, VA 24504

Madam:

The undersigned, having visited and examined the site and having carefully studied the Drawings and Project Manual for **Kemper Station Bike/Hike Trail** hereby proposes to furnish all plant, labor, equipment, materials, and services, and to perform all operations necessary to execute and complete the work required for the project in strict accordance with the Drawings and Project Manual dated January, 2005 together with Addenda numbered _____, issued during bidding period and hereby acknowledged, subject to the terms and conditions of the Agreement as follows:

For the sum of _____
DOLLARS (\$_____) which shall be referred to hereinafter as the BASE BID.

Alternate Deduct #1 -- \$_____
Substitute “Rockwood Retaining Wall System (Classic 6”)” for VDOT Std. RW-3 Formed Concrete Retaining Wall.

It is understood and agreed that the Owner, in protecting its best interest, reserves the right to reject any or all bids, or waives any defects in favor of the Owner. Any changes, erasures, deletions in the unit prices following, modifications in the bid form, or alternate bids not specified in the bid shall make the bid irregular and subject to rejection.

Contractors will indicate a unit price for each item listed for the work as described herein and on the plans, which shall cover furnishing all labor, materials, machinery, equipment, services, and completing the work on time. Unit prices shall be inclusive of related surveying, compaction testing, and blast monitoring. Quantities are based on estimated site quantities as shown on the plans. The Owner reserves the right to raise, lower, or eliminate any quantity or item. Unit prices shall be used in determining partial and final payments.

Kemper Station Bike/Hike Trail

ITEM NO.	REF. NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	02700	Mobilization	Lump Sum	-----	_____	_____
2	02200	Clearing and Grubbing	1.0	AC	_____	_____
3	02200	Regular Excavation	3,861	CY	_____	_____
4	01000	Rock Excavation	200	CY	_____	_____
5	02500	Type I, Size 21 Aggr. (4" layer)	5,890	SY	_____	_____
6	02500	RC-250 Seal Coat	1,767	GAL	_____	_____
7	02500	No. 78 Cover Stone	44	TON	_____	_____
8	02500	Bit. Conc. SM-12.5A	648	TON	_____	_____
9	02700	Silt Fence	500	LF	_____	_____
10	01000	Seeding & Fine Grading	11,270	SY	_____	_____
11	02700	Wooden Guardrail	4,088	LF	_____	_____
12	02700 02400	Retaining Wall	74	CY	_____	_____
13	02700	Trashcan	9	EA	_____	_____
14	02700	Bench	9	EA	_____	_____
15	02700	6' Chain Link Fence	1,490	LF	_____	_____
16	02700	8' Chain Link Fence	110	LF	_____	_____
17	02700	14' Gate for 8' CL Fence	1	EA	_____	_____
18	02700	Trail Marker	5	EA	_____	_____
19	02700	Park Rules Sign	6	EA	_____	_____
20	02700	Steep Grades Sign	5	EA	_____	_____
21	02700	Keep Right Sign	5	EA	_____	_____
22	02700	Directional Sign	5	EA	_____	_____
23	02700	Entrance Sign	1	EA	_____	_____
24	02700	Dismount Sign	2	EA	_____	_____

Kemper Station Bike/Hike Trail

25	02700	Do Not Enter Sign	2	EA	_____	_____
26	02700	Bike Rack	9	EA	_____	_____
27	02400	Formed Concrete	9	CY	_____	_____
28	02700	Belgium Block	240	SF	_____	_____
29	02720	15" HDPE Pipe	40	LF	_____	_____
	VDOT					
29A	02720	18" HDPE Pipe	40	LF	_____	_____
30	01000	EC-1	3	CY	_____	_____
31	02700	White Oak (1.5" caliper)	18	EA	_____	_____
32	02700	Sugar Maple(1.5" caliper)	18	EA	_____	_____
33	02700	Pink Dogwood(1.5" cal.)	18	EA	_____	_____
34	02700	Landscape Shrub Rose (3 gallon)	36	EA	_____	_____
35	02700	Witchhazel(3 gallon)	36	EA	_____	_____
36	02700	Sweet Shrub(3 gallon)	36	EA	_____	_____
37	02700	Iris(bareroot)	180	EA	_____	_____
38	02700	Beautyberry(3 gallon)	36	EA	_____	_____
39	02700	Fringe Tree(4-5 ft)	18	EA	_____	_____
40	02700	Itea(3 gallon)	36	EA	_____	_____
41	02700	Carissa Holly(3 gallon)	36	EA	_____	_____
42	02700	Serviceberry(4-5 ft)	18	EA	_____	_____
43	02700	Vitex(4-5 ft)	18	EA	_____	_____
44	02700	Oakleaf Hydrangea(3 gal.)	36	EA	_____	_____
45	02700	Jasmine(3 gallon)	36	EA	_____	_____
46	02700	Viburnum Setaceum(3 gal)	36	EA	_____	_____
47	02700	Buddleia(3 gallon)	36	EA	_____	_____
48	02700	Vinca Minor(quart)	90	EA	_____	_____
49	02700	Hypericum(3 gallon)	36	EA	_____	_____

Kemper Station Bike/Hike Trail

50	02200	Off-Site Borrow	5,000	CY	_____	_____
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TOTAL BASE BID \$_____

We are properly equipped to execute work of the character and extent indicated by the bidding documents and so covered by this Bid and will enter into Agreement for the execution and completion of the work in accordance with the Drawings and Project Manual and this Bid. We further agree that if awarded the Contract, we will commence the work within 10 days of the receipt of the Intent to Award/Notice to Proceed and substantially complete the work and all obligations within 159 consecutive days.

We agree to pay as liquidated damages, the sum of \$350 for each consecutive calendar day that the Substantial Completion is delayed in accordance with the Contract Agreement.

Enclosed herewith is the following Security, offered as evidence that the undersigned will enter into agreement for the execution and completion of the work in accordance with the Drawings and Project Manual.

Certified Check for the Sum of _____

Name of Bank _____

Bidder's Bond in Amount of _____

Bond Issued by _____

The undersigned hereby agrees, if awarded the contract, to execute and deliver to the Owner within ten (10) days after his/her receipt of the contract documents, satisfactory contract bonds as required in the amount of one hundred percent (100%) of the contract price.

The undersigned further agrees that in case of failure on his/her part to execute the said Agreement within the ten consecutive calendar days after receipt of the Agreement, the monies payable by the securities accompanying this Bid shall be paid to the City, as liquidated damages for such failure; otherwise the securities accompanying this Bid shall be returned to the undersigned.

The undersigned further certifies that this bid is not the result of, or affected by, any act of collusion with another person engaged in the same line of business, or any act of fraud punishable under the Virginia Government Frauds Act.

This Bid is subject to acceptance within a period of 90 days from this date.

This Firm assures that it will give its best efforts to use Disadvantaged Business Enterprises (DBE) wherever possible. We understand selection of successful bidder will include a consideration of cost and evaluation of whether the bidder has conscientiously attempted to use DBEs. A requirement of the Contract Agreement will be that a genuine concerted effort will be made to utilize DBEs wherever possible. Attached herewith is the completed Equal Opportunity

Report Statement (Attachment 1).

Attached herewith is a Certification of Nondiscrimination and Anti-Collusion Statement (Attachment 2). Failure to sign and notarize this statement may result in rejection of the bid.

Attached herewith is a completed Qualifications Report (Attachment 3), which includes the information requested for the past five years.

The undersigned further agrees to fulfill all requirements of Federal, State, and Municipal laws and guidelines, which may be applicable to this project, and as included in Appendices A-F. Attached herewith are completed VDOT forms C-104, C-105, and C-111 required as part of the bid.

Further, if determined to be the successful bidder, the below signed elects to utilize the escrow account procedure in accordance with the "Escrow Agreement" (Attachment 4), a copy of which is included in this manual.

Yes: _____ No: _____

In the event the successful bidder elects to use the escrow account procedure, the "Escrow Agreement" form shall be executed and submitted to the City of Lynchburg, Economic Development Office, within fifteen (15) calendar days after notification of award. If the "Escrow Agreement" form is not submitted within the fifteen-day period, the Contractor shall forfeit his/her rights to the use of the escrow account procedure.

Respectfully submitted,

Contractor

(address)

By: _____
(signature)

(typed/printed name & title)

Date: _____

Current Contractor's Virginia License No. _____ Code: _____

Telephone No.: _____

Fax No.: _____

EQUAL OPPORTUNITY REPORT STATEMENT (Attachment 1)

The Bidder shall complete the following statement by checking the appropriate blank as follows. The Bidder has _____ has not _____ participated in a previous contract subject to the non-discrimination clause prescribed by Executive Order 10925, dated March 6, 1961; Executive Order 11114, dated June 22, 1963; and Executive Order 11246, dated September 24, 1965.

In conjunction with the City of Lynchburg's policy to utilize Disadvantaged Business Enterprises wherever possible, the Bidder has solicited quotations for labor, material, and/or services from the following:

<u>NAME OF FIRM</u>	<u>PERSON(S) CONTACTED</u>	<u>DATE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Of those listed above, we intend, at this time, to utilize the following in the completion of the work required by this contract:

"This firm assures that it will give its best efforts to utilize Disadvantaged Business Enterprises wherever possible."

CERTIFIED BY: _____ (signature)
_____ (typed/printed name & title)

BIDDER'S NAME: _____

IRS NUMBER: _____

_____ This firm shall perform all construction with its own employees and, therefore, is not required to solicit quotations from DBE's.

FAILURE TO DOCUMENT AND REPORT DBE CONTACTS ON THIS FORM WILL BE A BASIS FOR REJECTION OF THE BID AS NONCONFORMING.

CERTIFICATION OF NONDISCRIMINATION AND ANTI-COLLUSION (Attachment #2)

By submitting their bids, all bidders certify to the Owner that they will conform to the provisions of the Federal civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginian's With Disabilities Act, the Americans With Disabilities Act, Section 2.2-4311 of the Virginia Public Procurement Act, and the Lynchburg Procurement Ordinance:

In every contract over \$10,000, the provisions below apply. During the performance of this contract, the contractor agrees as follows:

- A. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - B. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
 - C. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
2. The contractor will include the provisions of the foregoing paragraphs A, B and C in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

Certified by: _____ (corporate seal)

Date: _____

Note: I hereby certify that this bid is not the result of, or affected by, any act of collusion with another person engaged in the same line of business, or any act of fraud punishable under the Virginia Commonwealth Frauds Act.

_____ (seal)

Acknowledged before me this _____ day of _____, _____

Notary Public

My commission expires: _____

QUALIFICATIONS (Attachment 3)

The bidder shall state here what previous Municipal type work he/she has performed similar to that contemplated in this Contract, and give references that will afford the City of Lynchburg an opportunity to judge his/her experience and skill. List five projects of similar size and dollar value completed within the last five years.

Failure to provide satisfactory evidence of experience may cause the Bid to be rejected.

Location	Dollar	Year Completed	Owner/ Engineer	Telephone No.	Contact Person	Work Done
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ESCROW AGREEMENT (Attachment 4)

THIS AGREEMENT, made and entered into this _____ day of _____, 2005 by, between and among the City of Lynchburg (City),

_____(Contractor),

(Name of Bank)

(Address of Bank)

a trust company, bank, or savings and loan institution with its principal office located in the Commonwealth of Virginia (Bank), and _____

_____(Surety) provides:

I

The City and the Contractor have entered into a contract with respect to Kemper Station Bike/Hike Trail Project (Contract). This agreement is pursuant to, but in no way amends or modifies the Contract. Payments made hereunder or the release of funds from escrow shall not be deemed approval or acceptance of performance by the Contractor.

II

In order to assure full and satisfactory performance by the Contractor of its obligations under the Contract, the City's Director of Finance is required thereby to retain certain amounts otherwise due the Contractor. The Contractor has, with the approval of the City, elected to have these retained amounts held in escrow by the Bank. This agreement sets forth the terms of the escrow. The Bank shall not be deemed a part to, bound by, or required to inquire into the terms of, the Contract or any other instrument or agreement between the City and the Contractor.

III

The City shall from time to time pursuant to its contract pay to the Bank amounts retained by it under the Contract. Except as to amounts actually withdrawn from escrow by the City, the Contractor shall look solely to the Bank for payment of funds retained under the Contract and paid by the City to the Bank.

The risk of loss by diminution of the principal of any funds invested under the terms of this contract shall be solely upon the Contractor.

Funds and securities held by the Bank pursuant to this Escrow Agreement shall not be subject to levy, garnishment, attachment, lien, or other process whatsoever. Contractor agrees not to assign, pledge, discount, sell or otherwise transfer or dispose of his interest in the escrow account or any part thereof, except to the Surety.

IV

Upon receipt of checks or warrants drawn by the Director of Finance and made payable to it as escrow agent, the Bank shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in approved securities in accordance with the written instruction of the contractor. In no event shall the Bank invest the escrowed funds in any security not approved.

V

The following securities, and none other, are approved securities for all purposes of this Agreement.

- United States Treasury Bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,
- Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of Principal and interest by the United States,
- Bonds or notes of the City of Lynchburg,
- Bonds of any political subdivision of the City, if such bonds carried, at the time of purchase by the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service Rating of at least "A",
- Certificates of deposit issued by commercial Banks located within the Commonwealth, including, But not limited to, those insured by the Bank and its affiliates,

Any bonds, notes, or other evidences of indebtedness listed in first three above may be purchased pursuant to a repurchase agreement with a Bank, within or without the City having a combined capital, surplus and undivided profit of not less than \$25,000,000 provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein. The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the Bank is collateralized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to a least 100 percent of the amount of the repurchase obligation of the Bank, and the securities are held by a third party, and segregated from other securities owned by the Bank.

No security is approved hereunder which matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.

VI

The Contractor may from time to time withdraw the whole or any portion of the escrowed funds by depositing with the Bank approved securities in an amount equal to, or in excess of, the amount so withdrawn. Any securities so deposited or withdrawn shall be valued at such time of deposit or withdrawal at the lower of par or market value, the latter as determined by the Bank. Any securities so deposited shall thereupon become a part of the escrowed fund.

Upon receipt of a direction signed by the City's Director of Economic Development, the Director of Finance or the City Accountant shall authorize the Bank to pay the principal of the fund, or any specified amount thereof, to the account of the City of Lynchburg. Such payment shall be made in cash as soon as is practicable after receipt of the direction.

Upon receipt of a direction signed by the City's Director of Economic Development, the Director of Finance or the City Accountant shall authorize the Bank to pay and deliver the principal of the fund, or any specified amount thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor. Such payment and delivery shall be made as soon as is practicable after receipt of the direction.

VII

For its services hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank and the Contractor. Such fee and any other costs of administration of this Agreement shall be paid from the income earned upon the escrowed fund and, if such income is not sufficient to pay the same, by the Contractor.

VIII

The net income earned and received upon the principal of the escrowed fund shall be paid over to the Contractor in quarterly or more frequent installments. Until so paid or applied to pay the Bank's fee or any other costs of administration such income shall be deemed a part of the principal of the fund.

IX

The Surety undertakes no obligation hereby but joins in this Agreement for the sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the Contract are not affected hereby.

WITNESS the following signatures, all as of the day and year first above written.

CITY OF LYNCHBURG

CONTRACTOR:_____

BY:_____

City Manager

BY:_____

Officer, Partner, or Owner (seal)

SURETY:_____

BANK:_____

BY:_____

Attorney-in-fact (seal)

BY:_____

TITLE:_____

SECTION 00411 -- BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned, _____
_____ as Principal, and _____
as Surety, are hereby held and firmly bound unto _____
as Owner, in the penal sum of _____
DOLLARS (\$_____) for the payment of which, well and truly to be made, we
hereby jointly and severally bind ourselves, successors and assigns. Signed, this _____ day of
_____, 2005. The condition of the above obligation is such that whereas the
Principal has submitted to _____
a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing
for **KEMPER STATION BIKE/HIKE TRAIL**.

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the
Form of Contract attached hereto (properly completed in accordance with said BID) and shall
furnish a BOND for his faithful performance of said contract, and for the payment of all persons
performing labor or furnishing materials in connection therewith, and shall in all other respects
perform the agreement created by the acceptance of said BID.

Then this obligation, shall be void, otherwise the same shall remain in force and effect; if being
expressly understood and agreed that the liability of the Surety for any and all claims hereunder
shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety
and its BOND shall in no way be impaired or affected by an extension of the time within which
the OWNER may accept such BID; and said Surety does hereby waive notice of any such
extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals,
and such of them as are corporations have caused their corporate seals to be hereto affixed and
these present to be signed by their proper offices, the day and year first set forth above.

(Principal) (L.S.)

(Surety)

BY: _____

SURETY COMPANIES EXECUTING BONDS MUST APPEAR ON THE TREASURY DEPARTMENT'S MOST CURRENT
LIST (CIRCULAR 570 AS AMENDED) AND BE AUTHORIZED TO TRANSACT BUSINESS IN THE STATE WHERE
THE PROJECT IS LOCATED

SECTION 00510 – CONSTRUCTION AGREEMENT OR CONTRACT

This Agreement made and entered into on the _____ day of _____, 2005, by and between _____, party of the first part, hereinafter referred to as Contractor, and the City of Lynchburg, a municipal corporation of the Commonwealth of Virginia, party of the second part, hereinafter referred to as the Owner.

WITNESSETH: That the contractor, for the consideration hereinafter fully set out, hereby agrees with the Owner as follows:

1. That the Contractor shall furnish all labor, materials, tools, and equipment and perform all work in manner and form as contained in the Project Manual and Drawings for **Kemper Station Bike/Hike Trail** and all other specifications as referenced in these documents.
2. That the Contractor shall commence work within ten (10) days after award of the Contract and Notice to Contractor to Proceed with the work under contract, and shall substantially complete the work within 159 consecutive calendar days. Owner and Contractor recognize that time is of the essence of this Agreement and that the Owner will suffer financial loss if the work is not completed within the times specified in the Notice to Proceed, plus any extensions thereof allowed in accordance with the Project Manual. They also recognize the delays, expense and difficulties involved in providing the actual loss suffered by Owner if the work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Three Hundred and Fifty dollars (\$350.00) for each day that expires after the time specified for completion. If the Contractor is subject to liquidated damages the City has the right to withhold the liquidated damages from the Contractor's regular payments or retainage.
3. The Owner hereby agrees to pay the Contractor for the faithful performance of this Agreement subject to additions and deductions as provided in the Specifications or Proposal, in lawful money of the United States, as follows:

The sum of _____
dollars (\$_____).

4. On or before the end of each calendar month the Owner shall make partial payments to the Contractor on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the Contractor, less five percent (5%) of the amount of such estimate which is to be retained by the Owner until all work has been performed strictly in accordance with this Contract and until such work has been accepted by the Owner.
5. Upon submission by the Contractor of evidence satisfactory to the Owner that all

payrolls, material bills and other costs incurred by the Contractor in connection with the construction of the work have been paid in full, final payment on account of this Agreement shall be made within ninety (90) days after the completion by the Contractor of all work covered by this Agreement and the acceptance of such work by the Owner.

6. It is further mutually agreed between the parties hereto that if, at any time after the execution of this Agreement and Surety Bond hereto attached for its faithful performance,
the Owner shall deem the surety or sureties upon such bond to be unsatisfactory, or if for any reason, such bond ceases to be adequate to cover the performance of the work, the contractor shall at its expense, within five (5) days after the receipt of notice from the Owner so to do, furnish an additional bond or bonds in such form and amount, and such with surety or sureties as shall be satisfactory to the Owner. In such event no further payment to the contractor shall be deemed to be due under this Contract until such new additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Owner.
7. Contractor agrees to fulfill all requirements of Federal, State, and Municipal laws which may be applicable to this project.

This Agreement is executed in four counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original contract.

IN WITNESS WHEREOF, _____ has caused its name to be subscribed to this Agreement by _____ its _____, and its corporate seal to be hereunto affixed and attested by _____, its _____ said officers being duly authorized therefore; and the City of Lynchburg has caused its name to be hereunto subscribed by its City Manager, said officers being duly authorized therefore, all as to the day and year first above written.

Contractor

BY: _____

(SEAL)
ATTEST:

CITY OF LYNCHBURG

BY: _____
City Manager

(SEAL)
ATTEST:

Clerk of Council

APPROVED:

Director of Economic Development

APPROVED:

City Attorney

SECTION 00615 -- CONTRACT BOND

KNOW ALL MEN BY THESE PRESENT: That we _____ (Hereinafter called Principal) and _____ (Hereinafter called Surety) are held and firmly bond unto the City of Lynchburg (Hereinafter called Owner) in the penal sum of _____ DOLLARS (\$ _____) for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns for the faithful performance of a certain written contract, dated the _____ day of _____, 2005 entered into between the Principal and the City of Lynchburg for **Kemper Station Bike/Hike Trail.**

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall faithfully perform the terms and conditions of the contract in all respects on his or its part and shall fully pay all obligations incurred in connection with the performance of such contract on account of labor and materials used in connection therewith and all such obligations of every form, nature and character, and shall save harmless the owner from any and all liability of every nature, kind and character which may be incurred in connection with the performance of fulfillment of such contract on the part of the Principal or other such liability resulting from negligence or otherwise on the part of the Principal, and further shall save harmless the Owner from all costs and damage which may be suffered by reason of the failure of the Principal to fully and completely perform said contract, and shall fully reimburse and repay the Owner for all expenditures of every kind, character and description which may be incurred by the Owner in connection with making good any and every default which may exist on the part of the Principal in connection with the performance of said contract; and further that if the Principal shall pay all lawful claims of all persons, firms, partnerships or corporations for labor performed and materials furnished in connection with the performance of the contract (we agreeing that failure so to do shall give such persons, firms, partnerships or corporations a direct right of action against either the Principal or Surety under this obligation, or both said Principal and Surety), then this obligation shall be void, otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated;

PROVIDED HOWEVER, that this bond is issued subject to the following conditions and privileges:

- (1) That no suit, action or proceeding by reason of any default whatever on the part of the Principal shall be brought on this bond after one year from the date on which final payment on the contract falls due;
- (2) That any alterations or additions which may be made under the contract or the work to be done under it or the giving by the Owner of any extension of time for the performance of the Contract, or any other forbearance on the part of either the Owner or the Principal shall not in any way release the Principal and Surety, or either of them, their heirs,

executors, administrator, successors or assigns, from their liability hereunder, notice to the Surety of any such alterations, extensions or forbearances being expressly waived. Executed in four counterparts.

IN WITNESS WHEREOF, _____, the Principal, has caused its name to be hereunto subscribed and its corporate seal to be hereunto affixed and duly attested by its proper officers heretofore duly authorized this _____ day of _____, 2005, and the Surety has caused its name to be hereunto subscribed and its seal affixed by its authorized Attorney-in-Fact.

BY: _____
President

(SEAL)
ATTEST:

Secretary

BY: _____
Attorney-in-Fact

BY: _____

Approved as to form and legality:

City Attorney

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

[INSERT LOGOS]

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General [seal] Contractors of America

Construction Specifications Institute

[seal]

These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-8-A-1 or 1910-8-A-2) (1996 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC User's Guide (No. 1910-50). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17) (1996 Edition).

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1420 King Street, Alexandria, VA 22314

American Consulting Engineers Council
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American Society of Civil Engineers
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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.

3. *Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

9. *Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the

Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

13. *Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment.

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Cost of the Work*--See paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by ENGINEER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *ENGINEER*--The individual or entity named as such in the Agreement.

20. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. *Field Order*--A written order issued by ENGINEER which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. *General Requirements*--Sections of Division I of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

24. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

25. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

33. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

34. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

35. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

36. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

37. *Resident Project Representative*--The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

40. *Site*--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.

41. *Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

42. *Subcontractor*--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

43. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

44. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

45. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

46. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum

products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

47. *Unit Price Work*--Work to be paid for on the basis of unit prices.

48. *Work*--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

49. *Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 Terminology

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such

term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. *Day*

1. The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 *Copies of Documents*

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *CONTRACTOR's Review of Contract Documents:* Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby;

however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and
3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

C. *Evidence of Insurance:* Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.

2.06 *Preconstruction Conference*

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.

2. CONTRACTOR's schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.

C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws, and Regulations*

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to

OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.

3.05 *Reuse of Documents*

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific

written verification or adaption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

B. Upon reasonable written request, OWNER shall furnish CONTRACTOR with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and
2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except

Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection

therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *ENGINEER's Review:* After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility.

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price of Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

4.05 *Reference Points*

A. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points

or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such

condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

F. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph

4.06.E shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.F shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

5.04 *CONTRACTOR's Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

1. with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 *OWNER's Liability Insurance*

A. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of

them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;

5. allow for partial utilization of the Work by OWNER;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with paragraph 5.06 will contain a provision or endorsement that the coverage afforded will

not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.07.

D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

5.07 *Waiver of Rights*

A. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraph 5.06 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary

Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion pursuant to paragraph 14.04, or after final payment pursuant to paragraph 14.07.

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by paragraph 5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on

account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

B. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but

the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

6.02 *Labor; Working Hours*

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using

the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.

1. *"Or-Equal" Items:* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;

b. CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items*

a. If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be

accepted by ENGINEER from anyone other than CONTRACTOR.

c. The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in

ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.

C. *Engineer's Evaluation:* ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. *Special Guarantee:* OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.

E. *ENGINEER's Cost Reimbursement:* ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

F. *CONTRACTOR's Expense:* CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in

advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appro-

priate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

6.07 *Patent Fees and Royalties*

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in paragraph 10.05.

6.10 *Taxes*

A. CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all

property not designated for alteration by the Contract Documents.

D. *Loading Structures:* CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 *Safety and Protection*

A. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or

loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to means, methods, techniques, sequences, and procedures of

construction and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. ENGINEER's Review

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. ENGINEER's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation

from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures*

1. CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR's General Warranty and Guarantee*

A. CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

B. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will

constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by ENGINEER;
2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test, or approval by others; or
8. any correction of defective Work by OWNER.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and
2. is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for

whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 7 - OTHER WORK

7.01 *Related Work at Site*

A. OWNER may perform other work related to the Project at the Site by OWNER's employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to CONTRACTOR prior to starting any such other work; and

2. if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If OWNER intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility for such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 *Replacement of ENGINEER*

A. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.03 *Furnish Data*

A. OWNER shall promptly furnish the data required of OWNER under the Contract Documents.

8.04 *Pay Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 *Insurance*

A. OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.09 *Limitations on OWNER's Responsibilities*

A. The OWNER shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *OWNER'S Representative*

A. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

9.02 *Visits to Site*

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER

may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

A. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

B. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

9.08 *Determinations for Unit Price Work*

A. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.

9.09 Decisions on Requirements of Contract Documents and Acceptability of Work

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 Limitations on ENGINEER's Authority and Responsibilities

A. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any

other individual or entity, or to any surety for or employee or agent of any of them.

B. ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

C. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 Authorized Changes in the Work

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change

Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.05 *Claims and Disputes*

A. *Notice:* Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 60 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

- a. The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

- b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

- c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with

rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.

C. *CONTRACTOR's Fee:* When all the Work is performed on the basis of cost-plus, CONTRACTOR's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined as set forth in paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 *Cash Allowances*

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to

cover CONTRACTOR's overhead and profit for each separately identified item.

C. OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
2. there is no corresponding adjustment with respect any other item of Work; and
3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or
2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2); or
3. where the Work involved is not covered by unit prices contained in the Contract Documents

and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C).

C. *CONTRACTOR's Fee:* The CONTRACTOR's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR's fee shall be 15 percent;
 - b. for costs incurred under paragraph 11.01.A.3, the CONTRACTOR's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 *Delays Beyond CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.04 *Delays Within CONTRACTOR's Control*

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 *Delays Beyond OWNER's and CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 *Delay Damages*

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier,

or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or
2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all

inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;
2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and
3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

F. Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspect-

ed or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 *OWNER May Stop the Work*

A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.09 *OWNER May Correct Defective Work*

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and ENGINEER and ENGINEER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 20 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Applica-

tion for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to pro-gress payments will be as stipulated in the Agreement.

B. Review of Applications

1. ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to

any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Written Amendment or Change Orders;

c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or

d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. Reduction in Payment

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

a. claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;

c. there are other items entitling OWNER to a set-off against the amount recommended; or

d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly

pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.

14.03 CONTRACTOR's Warranty of Title

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.04 Substantial Completion

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written

recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially

complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of

CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

B. *Review of Application and Acceptance*

1. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due*

1. Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.08 *Final Completion Delayed*

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the

remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *OWNER May Suspend Work*

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 *OWNER May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any

retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.03 *OWNER May Terminate For Convenience*

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *CONTRACTOR May Stop Work or Terminate*

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or

remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

SECTION 00815 – SUPPLEMENTARY CONDITIONS

1.0 SUPPLEMENTS:

- 1.01 These supplementary conditions amend or supplement the Standard General Conditions of the Construction Contract, NSPE Document 1910-8, 1996 Edition, and other provisions of the contract documents to the extent indicated. All provisions which are not so amended or supplemented remain in full force and effect.

2.0 DEFINITIONS:

- 2.01 The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (No. 1910-8, 1996 Edition) have the meanings assigned to them in the General Conditions except that the “Engineer” shall be the Owner or his designated representative.

2.02 Add to Article 1 – Definitions and Terminology:

- A. “Completion” and “Substantial Completion” as these terms apply to Contract Time (Article 12), Completion (Article 14), Computation of the Time (Paragraph 17.02), and Contract Time and Liquidated Damages (Form of Agreement, Article 3) shall be the same.
- B. “Engineer” shall be the Owner or his designated representative.

3.0 COPIES OF DOCUMENTS:

- 3.01 Modify Article 2.02 as follows: For construction purposes the Contractor will be issued, free of charge, the following documents:

Project Manuals – 3 sets
Original Size Drawings – 3 sets of prints

If the Contractor requires additional sets of documents during the construction period (above the number specified above), he may obtain them at the cost of reproduction.

- 4.0 Delete paragraph “2.05 Before Starting Construction” in its entirety.
- 5.0 Replace Article 4, Paragraph 4.01 B with following: “Record legal title and legal description of the lands upon which the work is to be performed may be obtained at the City of Lynchburg Clerk of Circuit Court’s office at the cost of reproduction.”
- 6.0 In addition to Article 4, Paragraph 4.02: Prior to bidding, contractor may make subsurface investigations in City right-of-way and in easements only if coordinated

through Mary Jane Russell, (434) 455-4493.

7.0 BONDS:

7.01 Add the following to Article 5, Paragraph 5.01.

D. The Contractor shall secure and provide all bonds called for in the General Conditions and Instructions to Bidders. All bonds shall be written by sureties or insurance companies licensed to do business in the Commonwealth of Virginia.

8.0 Delete the second sentence in Article 5, Paragraph 5.03 A.

9.0 INSURANCE:

9.01 Replace Article 5 with the following requirements:

ARTICLE 11 - INSURANCE

A. Contractor's Insurance:

1. During the term of this Contract, the Contractor shall procure and maintain insurance coverage with insurance companies rated by A. M. Best Company as A – VIII or better. The company (ies) shall be authorized to do business under the laws of the Commonwealth of Virginia and be acceptable to the City of Lynchburg and shall provide the following minimum types of insurance:

- a. **Commercial General Liability Insurance** – This will cover claims for Bodily Injury, Property Damage, Personal and Advertising Injury, Products and Completed Operations, which may arise from operations under the Contract, whether such operations be performed by the Contractor or by any Subcontractor or Independent Contractor, or by anyone directly or indirectly employed by any of them. Such insurance shall include coverage's "X", "C" and "U" for explosion, collapse of other structures and underground utilities, as well as Contractual Liability Insurance covering the requirements outlined in the General Conditions. This insurance shall name the City, the City Council and its employees as additional insureds *by endorsement* to the Commercial General Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this contract. If endorsements to the Commercial General Liability insurance policies cannot be made, then separate policies providing such protection shall be purchased by the Contractor.

1. The Policy shall have the following *minimum* limits:

\$1,000,000 Each Occurrence Limit

\$1,000,000 General Aggregate Limit

\$1,000,000 Personal and Advertising Injury Limit

\$1,000,000 Products and Completed Operations Aggregate Limit

\$5,000 Medical Expense Limit

This insurance shall include the following provisions and /or endorsements:

- 1) The General Aggregate limit shall apply on a “per project” and on a “per location” basis;
- 2) Coverage shall apply to all liability arising from all premises and operations conducted by the Contractor, subcontractors and independent contractors;
- 3) The Contractor agrees that liability arising from Products and Completed Operations will be covered. Such liability coverage will be maintained for two years after completion of the Work.
- 4) The Contractor shall require each of his Subcontractors to procure and maintain Commercial General Liability Insurance of the type specified in this document in the minimum amounts required by the City and the Contractor, during the term of this subcontract.

Worker's Compensation and Employer's Liability Insurance for the Contractor's employees engaged in the Work under this Contract, in accordance with the Statutory requirements of the Commonwealth of Virginia. The Contractor shall require each of his Subcontractors

to provide Worker's Compensation and Employer's Liability Insurance for all of the Subcontractor's employees engaged on such subcontracts. If any class of employees engaged on work under the Contract is not protected under the Worker's Compensation statute, the Contractor shall provide similar protection for these employees in amounts not less than the legal requirements. The amount of Employer's Liability Insurance for the Contractor and each of his Subcontractors shall be not less than:

\$100,000 per employee for Bodily Injury.

\$100,000 per employee for disease

\$500,000 per policy for disease

The Worker's Compensation and Employer's Liability Insurance policy shall include an "all states" or "other states" endorsement.

- d. Commercial **Automobile Liability Insurance**, including coverage for owned, hired, non owned and borrowed vehicles used in the work with *minimum* limits of \$1,000,000 Combined Single Limit per occurrence. This insurance shall name the City, the City Council and its employees as additional insureds *by endorsement* to the Commercial Automobile Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this contract.

- di. **Umbrella Liability or Excess Liability Insurance** with the following *minimum* limits of:

\$5,000,000 Each Occurrence

\$5,000,000 Annual Aggregate

The following policies shall be scheduled as underlying policies:

Commercial General Liability

Commercial Automobile Liability

Employers Liability

This insurance shall name the City, the City Council and its employees as additional insureds **by endorsement** to the Umbrella or Excess Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this contract.

- e. **Builders Risk Property Insurance** covering all risks of direct physical loss to the Work, including flood and earthquake damage. It shall also cover all materials and supplies whether at the job site, at a separate storage site or while in transit. The policy shall be payable to the City, and the proceeds thereof, when paid, will be retained by the City as security for the performance by the Contractor of his obligations under the terms and conditions of this Contract and, upon such performance, will be released to the Contractor. The policy shall be in an amount equal to the Contract Sum and shall apply to any and all Projects under construction during the term of this Contract.

- 2. Proof of insurance for each type of coverage listed herein shall be provided within 10 Days after issuance of the Award Letter for the Contract, and no Work shall proceed unless all such insurance is in effect. The Contractor shall not allow any Subcontractor to commence work on his subcontract until all such insurance of the Subcontractor has been so obtained and approved by the Contractor and found to be in accordance with the requirements set forth herein. The Contractor certifies by commencement of

the Work that his insurance and that of Subcontractors is in effect and meets the requirements set forth herein.

3. The Contractor shall purchase and maintain required liability and all other insurance as is appropriate for the Work being performed and furnished. The insurance shall provide protection from claims which may arise out of or result from Contractor's performance and furnishing of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:
 - a. claims under Worker's Compensation, Employers Liability, disability benefits, and other similar employee benefit acts;
 - b. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - c. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - d. claims for damages insured by personal injury liability coverage which are sustained: (1) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor; or (2) by any other person for any other reason;
 - e. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting there from; and

- f. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle.

4. The insurance required to be purchased and maintained by the Contractor shall:

- a. include completed operations insurance;
- b. with respect to any other insurance coverage written on a claims-made basis, remain in effect for at least 2 years after final payment (and Contractor shall furnish the City and Engineer evidence satisfactory to the City of continuation of such insurance at final payment and 1 year thereafter);
- c. contains a cross liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance.

B. All of the aforesaid insurance policies must be endorsed to provide that the insurance company *shall give 30 days written notice to the City* if the policies are to be terminated or if any changes are made during the Contract period which will affect in any way the insurance requirements required in this contract. Before starting the Work, the Contractor shall provide the City with a copy of each policy which he and each of his Subcontractors shall carry in accordance herewith, together with receipted bills evidencing proof of premium payment. These policies shall contain endorsements to the policies naming the City of Lynchburg as an additional insured as required.

- C. Nothing contained herein shall effect, or shall be deemed to affect, a waiver of the City's sovereign immunity under law.

10.0 CONTRACTOR'S RESPONSIBILITIES:

10.01 Labor, Materials, and Equipment: Add the following to Paragraph 6.05: "All materials incorporated in the work of this Contract shall be free of asbestos and other hazardous materials."

10.02 Subcontract Work: Add the following to paragraph 6.06.B:

"6.06.B Except as otherwise noted herein, contract work amounting to not less than 80 percent of the total project or contract shall be performed with the contractor's own organization. 'Specialty Items' so designated by the Engineer may be performed by subcontract and the cost of any 'Specialty Items' so performed may be deducted from the total project or contract cost before computing the amount of work required to be performed by the Contractor's own organization. 'Specialty Items' for this project shall consist of concrete work, landscaping, seeding. Contractors may be relieved of this 80 percent in-house requirement by filing appropriate qualification statements for all partners or subcontractors that are to be used for the project. The Owner reserves the right to reject bids based on evaluation of qualifications of all proposed contractors, partners, or subcontractors."

10.03 A blasting permit issued by the City Fire Marshal will be required for blasting, this permit may require additional insurance coverage.

10.04 A business license will be required and will be \$0.16 per \$100 on gross fee (or current rate by City code) and shall be obtained from the Commissioner of Revenue.

10.05 Eliminate 6.11, A., Item 3.

10.06 Eliminate 6.20 in its entirety.

10.07 The contractor shall be responsible for all safety at the job site and shall comply with all OSHA regulations.

11.0 Delete paragraph 8.06 in its entirety.

12.0 Add the following to Article 9, paragraph 9.03:

"B. Inspectors employed by the City of Lynchburg will be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the

materials used. The inspector will not be authorized to revoke, alter, or waive any requirements of these specifications; however, he will have authority to reject materials or suspend the work until any questions or issues concerning materials can be referred to and decided by the Engineer. The presence or absence of an inspector shall not lessen the responsibility of the Contractor to properly perform the work.”

13.0 Not used.

14.0 Replace paragraph 14.02.C--Payments with the following:

- “14.02.C.1 The Owner will make partial payments to the Contractor on the last business day of the month by check via first class mail through the U. S. Postal Service for a duly certified and approved estimate of work performed during the preceding calendar month (subject to the provisions of the last sentence of paragraph 14.7) and the Agreement.
- 14.02.C.2 The Contractor shall take one of the two following actions within seven days after receipt of payment from the Owner with regards to work performed by a Subcontractor and/or Supplier under their Contract:
- A. Pay the Subcontractor and/or Supplier for the proportionate share of the total payment received from the Owner attributable to the work performed by the Subcontractor and/or Supplier under their Contract, or
 - B. Notify the Owner and Subcontractor and/or Supplier, in writing, of his intention to withhold all or part of the Subcontractor’s and/or Supplier’s payment with the reason for nonpayment.
- 14.02.C.3 The Contractor will pay interest to the Subcontractor and/or Supplier on all amounts owed by the Contractor that remain unpaid after seven days following receipt by the Contractor of payment from the Owner for work performed by the Subcontractor and/or Supplier under this contract, except for amounts withheld as allowed above. Interest shall accrue at the rate of one percent per month.
- 14.02.C.4 The Contractor shall include in each of its Subcontracts a provision requiring each Subcontractor and/or Supplier to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier Subcontractor and/or Supplier. A Contractor’s obligation to pay an interest charge to a Subcontractor and/or Supplier pursuant to the payment clause in this section may not be construed to be an obligation of the Owner’s. A Contract modification may not be made

for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.”

15.0 Delete Article 16—Dispute Resolution in it’s entirety and replace with the following:

“16.01 Contractual claims, whether for money or other relief, shall be submitted in writing to the City Manager with copy to Purchasing Agent, no later than 60 days after final payment; however, written notice of the Contractor’s intention to file such claim shall have been given within 10 days of the occurrence of the event giving rise to the claim or the beginning of the work upon which the claim is based. Nothing herein shall preclude a contract from requiring submission of an invoice for final payment within a certain time after completion and acceptance of the work or acceptance of the goods. Pendancy of claims shall not delay payment of amounts agreed due in the final payment. The decision of the City Manager on the claim shall be final unless appealed to the Lynchburg Circuit Court as provided by law.”

16.0 Delete paragraph 17.05 A. in its entirety and replace with the following:

“A. This contract shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia and the Lynchburg Public Procurement Ordinance. The successful contractor submits itself to the jurisdiction of a court of competent jurisdiction in the City of Lynchburg Courts shall be the appropriate forum.”

SECTION 01000 – GENERAL REQUIREMENTS

(Revised 10/25/04)

PART 1 - GENERAL

1.1 SUMMARY OF WORK

Work covered by the Contract Documents consists of providing all work indicated on Drawings or required by Project Manual dated _____, 20____ for the project.

- 1.2 The Owner agrees to make the _____ site accessible to the Contractor _____. To arrange for access at these or any other times permitted by the Owner, the Contractor shall be accompanied by City personnel for unlocking or locking the facility when leaving. No keys will be furnished for use by the Contractor.

1.3 CONFLICT BETWEEN PLANS AND SPECIFICATIONS

Any plans drawn by the Engineer to supplement the specifications are intended to be explanatory, but, should any discrepancy appear or any misunderstanding arise as to anything contained in either, the explanation of the Engineer shall be final and binding on the Contractor. Any corrections of errors or omissions in drawings and specifications may be made by the Engineer when such corrections are necessary for the proper fulfillment of their intentions as construed by him. Any adjustment by the Contractor without such a determination shall be at his own risk and expense. Supplemental drawings, if necessary, showing further detail may be made in accordance with the contract and these specifications and such supplemental drawings shall become part of the contract.

1.4 SPECIFICATIONS AND DRAWINGS

The Contractor shall keep at the work site a copy of the approved drawings and specifications including all authorized change orders and shall at all times give the Engineer access thereto.

1.5 AUTHORITY OF THE ENGINEER

The Engineer or his representatives shall have free access to the sites at all times for measuring and inspecting materials and work. The Contractor shall afford him all necessary facilities and assistance for doing so. To prevent disputes and litigations, the Engineer shall in all cases determine the amount, quantity, acceptability, and the fitness of the several kinds of work and materials which are to be paid under the contract. He shall decide all questions which may arise as to the interpretation of the Specifications or Plans relating to the work, the fulfillment of this Contract on the part of the Contractor, and the rights of the different Contractors on the project. Such decisions shall be final and conclusive upon the parties of the Contract. The representation, measurement, and inspection by the Engineer shall in no way relieve the Contractor from the responsibility to perform the work in accordance with the Contract. Methods and techniques of

construction used by the Contractor and by the Subcontractors and others in performance of their Contract shall not be subject to the control of the Owner or the Engineer, and neither the Owner nor the Engineer shall be responsible or liable for injury, damage, or loss resulting from such construction methods or techniques.

1.6 CONSTRUCTION INSPECTION

The Construction Coordinators employed by the City shall be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials used. The Construction Coordinators are not authorized to revoke, alter, or waive any requirements of these specifications; however, he shall have authority to reject materials or suspend the work until any questions or issues can be referred to and decided by the Engineer. The presence or absence of a Construction Coordinator shall not lessen the responsibility of the Contractor to properly perform the work.

1.7 SUPERVISION

The Contractor shall give his personal supervision to the faithful execution of the work and in case of his absence; he shall at all times have a competent superintendent present on the job. This person must be capable of performing all work specified to the satisfaction of the Engineer. The contractor shall not change superintendents during the course of the job except an extraordinary conditions and only when approved by the Engineer.

1.8 RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall take all responsibility for the work and shall bear all risk of damage or loss to the project until final acceptance; and shall take all precautions for preventing injuries to persons and property in or about the work; shall bear all losses resulting to him on account of the amount or character of the work, or because the nature of the land in which or on which the work is done is different from what was estimated or expected or on account of the weather, elements, or other causes including, but not limited to, theft, vandalism, accidents, and natural disasters; and, shall assume the defense of and indemnify and save harmless the City, its employees, and officers and agents from and against any and all claims, liabilities, judgments, costs, causes of actions, damages, and expenses, and shall pay all Attorney's fees, court costs and other costs incurred in defending such claims, which may accrue against, be charged to, be recovered from or sought to be recovered from the City, its employees, officer and agents by reason of the Contractor's work, whether, such claims arise from the labor and materials, furnished for the work; from inventions, patents, and patent rights used in doing the work. The Contractor shall be responsible for any personal injury, death, property damage, expenses, damages, losses and costs of any nature whatsoever, including economic loss to the City, its employees, officers and agents, or any third party may suffer as a result of the negligent or willful acts or omissions of the Contractor's work or the acts or omissions of the Contractor's employees, officials or agents in performing the work or furnishing materials thereto or caused by the acts of any other person regardless of whether or not such persons are subject to the Contractor's control; or in consequence

of any improper materials or implements of labor used therein; and, through any act, omission, or neglect of the Contractor and his employees, official and agents. The City, its employees, officers and agents shall not have to give the Contractor any specific type of notice of claims arising out of the Contractor's work.

This section shall not require the Contractor to indemnify and save harmless the City, its employees, officers and agents, for bodily injury to persons, or damage to property caused by or resulting solely from the negligence of the City, its employees, officers and agents.

The Contractor shall at all times enforce strict discipline and good order among his employees; and shall seek to avoid employing on the work any unfit person or anyone not skilled or qualified in the work assigned to him.

1.9 CHARACTER OF WORKMEN AND EQUIPMENT

The Contractor shall at all times employ sufficient number of workmen for the proper performance of work in the manner and times specified; preference being given to local labor. The Engineer may demand the dismissal of any person or persons employed by the Contractor in, about, or upon the work, who shall misconduct himself or be incompetent or held negligent in the proper performance of his or their duties, or neglects or refuses to comply with the directions given, and such person or persons shall not be employed again without the written consent of the Engineer. Should the Contractor continue to employ or again employ such persons, the Engineer may withhold all estimates that are or may be due, or the Engineer may suspend the work until such orders are complied with.

The Contractor shall furnish such equipment as considered necessary for the proper execution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools, and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Engineer and shall be maintained in a satisfactory working condition. The contract may be terminated if the Contractor refuses to provide adequate equipment for the work.

The Contractor shall have posted in a conspicuous spot with his equipment and on the work site a sign or sticker identifying his equipment as to its owner and an emergency 24-hour phone number.

1.10 COMPLIANCE WITH THE LAW

The Contractor shall at all times comply with all Federal, State, and Municipal laws, ordinances, and regulations in any manner affecting those engaged or employed in the work or the materials and appliances used in the work. He shall protect the City against any claims or liability arising from or based upon the violation of such laws, ordinances, regulations, orders, or decrees, whether by himself or his employees, and shall be liable for all damages due to his neglect.

1.11 All references to City Engineer, Utilities Engineer, and City Construction Coordinator within these specifications represent those positions and their designees.

1.12 PAYMENT

A. Applications for Payment

- (1) The form of each application for payment shall be AIA Document G702 entitled, "Application and Certificate for Payment" accompanied by, "Continuation Sheet," AIA Document G703. Each application for payment by the Contractor, excluding the first, shall be accompanied by a "Contractor's Affidavit of Payment of Debts and Claims," AIA Document G706; "Contractor's Affidavit of Release of Liens," AIA Document G706A; and a DBE Usage Form (to be furnished by Owner). Payment for stored material delivered but not incorporated in the work will be the invoiced amount only. Stored materials drawdown shall be approved by the Owner. Submit applicable invoices with Application for Payment. Monthly partial payment request shall be submitted in **TRIPLICATE** to _____ for approval by the 25th of the month so that the Owner can receive the approved payment request by the first working day of the next month. Partial payments shall be made on a monthly basis on or before the end of the next month for which the work was performed, in accordance with the Contract Documents.
- (2) The Owner shall pay to the Contractor 95 percent of the total amount due and the Owner shall retain five (5) percent of the amount due until all work has been performed strictly in accordance with the Contract Documents and until such work has been accepted by the Owner.

B. Change Order Procedures

- (1) No amount, in part or in whole, of a Change Order shall be included in a requisition for payment by the Contractor until the Change Order has been executed and copies of the Change Order have been distributed to the Owner and Contractor.
- (2) **Proceed Orders:** A Proceed Order is a device which enables the Owner to promptly order changes in the work which may involve changes in cost or contract time, or both pending preparation and execution of a formal Change Order.
- (3) **Request for Change Order Proposal:** The Owner may request the Contractor to submit a Change Order Proposal for changes in Contract work. The Contractor shall submit the proposal in accordance with contract requirements within a reasonable time. The Owner may issue to the Contractor a Proceed Order authorizing the required changes for an additional amount not to exceed, or a deduction of not less than the amount shown in the Proceed Order. If the Contractor is not in agreement with the amount stipulated in the Proceed Order, he shall, within a reasonable time after the issue date of the order, submit an equitable proposal and develop with the Owner a mutually acceptable price for the required change in work.

- (4) **Change Order Proposal:** Without further request and within a reasonable time from the issue date of a Proceed Order, the Contractor shall submit a written Change Order Proposal covering the work authorized in the Proceed Order so that a Change Order may be prepared for execution.

1.13 EXISTING WORK

- A. Removal and alteration of existing work shall include work necessary to provide final conditions as shown on drawings. Complete such work carefully to minimize disturbance to adjacent areas.
- B. Restore any areas disturbed during construction to their original condition, including patching, painting, etc. to the satisfaction of the Owner and the Engineer.
- C. If work is not as anticipated or involves structural considerations, notify Engineer prior to proceeding.

D. **Defective and Unauthorized Work**

Any work or materials not in accordance with these specifications will be rejected. All work that has been rejected or condemned shall be repaired or, if it cannot be satisfactorily repaired, shall be removed and replaced at the Contractor's expense. Materials not conforming to the requirements of these specifications shall be removed immediately from the site of the work and replaced with satisfactory material by the Contractor at his own expense.

Upon the failure of the Contractor to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned work or materials immediately after receiving formal notice from the Engineer, the Owner may recover for such defective work or materials on the Contractor's bond or by action in court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of same to the Contractor, which cost will be deducted from any monies due him.

The approval of material and workmanship by the Construction Engineer, Construction Coordinator, or any employee of the Engineer, does not under any consideration preclude the right of the Engineer to reject all or any part of the same at any time previous to final payment, if found not to be in accordance with these specifications, nor does any inspection of work release the Contractor from any of his obligations to fulfill his Contract as herein specified and defective work and materials shall be made good or rejected notwithstanding such work and materials that may have been previously accepted for payment.

At the request of the Engineer the Contractor shall, at any time before final acceptance of the work, remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore the said portions of the work to the standards required by the Contract Documents. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the

replacing of the covering or making good of the parts removed shall be paid for as extra work, but should the work so exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or the making good of the parts removed, shall be at the Contractor's expense.

Work done without lines and grades having been given, work done beyond the lines and grades shown on the plans, or as given, except as herein provided, work done without proper inspection, or any extra or unclassified work done without written authority and proper agreement in writing as to prices, will be done at the Contractor's risk and will be considered unauthorized and, at the option of the Engineer, may not be measured and paid for and may be ordered removed and replaced at the Contractor's expense.

E. Abandonment and Neglect

If the work to be done under this contract shall be abandoned, or if this contract or any part thereof shall be sublet without the previous written consent of the City, or the contract or any claim therein shall be assigned by the Contractor, otherwise than as herein specified, or if at any time the Engineer shall be of the opinion and shall so certify, in writing, to the City that the conditions herein specified as to the rate of progress is not being fulfilled, or that the work or any part thereof is unnecessary or unreasonably delayed, or that the Contractor has violated any of the provisions of the Contract, the City may notify the Contractor to discontinue all work or any part thereof, as the City may designate, and the City may thereupon, by Contract or otherwise, as it may designate or determine, complete the work, or such part thereof and charge the entire expense of so completing the work or part thereof to the Contractor; and for such completion the City, for itself, or its Contractors may take possession of and use or cause to be used in the completion of the work, tools, equipment, and appliances of every description as may be found at the location of said work.

All expenses charged under the above article shall be deducted and paid for by the City out of any monies then due or to become due the Contractor under this Contract or any part thereof; and in such accounting the City shall not be held to obtain the lowest figures for the work of completion, but all sums actually paid thereof shall be charged to the Contractor.

In case the expense so charged is less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference; in case such expense shall exceed the said sum, the Contractor or his bondsmen shall pay the amount of the excess to the City.

Permitting the Contractor to continue the work or any part of it after the time has expired for its completion, or after the date to which the time for the completion may have been extended, shall in no way operate as a waiver on the part of the City or any of its rights under this contract.

The Contractor shall be expected to commence work and continue such work on a particular job on a time schedule set forth by the Engineer in written "Notice to Proceed" and any executed change orders. Failure to comply with this regulation shall be considered as "Abandonment and Neglect" by the Contractor and the penalties described in this section shall be invoked.

1.14 PROJECT MEETINGS

- A. Contractor shall arrange a Preconstruction Conference within ten (10) days after the effective date of the Agreement. At a minimum, attendees shall include the Contractor, Owner, City Construction Coordinator, City Project Manager, City Engineer, and Engineer. Items of discussion shall include, but not limited to the following:

Tentative Construction Schedule
Work Sequencing
Designation of Responsible Personnel
Use of the Premises
Office, Work and Storage Areas
Equipment/Material Deliveries and Priorities
Security and Working Hours
Housekeeping

- B. **Progress Meetings:** At regular intervals, to be determined during the Preconstruction Conference, the Contractor shall hold a progress meeting to review progress to date and to resolve questions. Notify the Owner and Engineer at least one week in advance of the meeting to insure suitable date and time. Include meeting agenda with notification. Persons designated by the Contractor to participate in Progress Meetings shall have all required authority to commit the Contractor to decisions agreed upon.
- C. Contractor shall record all meeting results and distribute copies to everyone in attendance and others affected by decisions made in meetings.

1.15 SUBMITTALS

The following submittals shall be submitted to Owner.

- A. **Progress Schedules:** Submit a detailed construction schedule prior to the Preconstruction Conference. Revise the schedule before each progress meeting.
- B. **Shop Drawings, Product Data, and Samples:** Within 10 days of Notice to Proceed, prepare a submittal schedule fixing the dates for submission of shop drawings, product data, samples, and the like and update this schedule at each Progress Meeting to reflect the status of each submittal item.

(1) Submit five copies of all shop drawings.

(2) A maximum of three marked copies will be returned to the Contractor.

- (3) Submit shop drawings, product data, samples, and the like as required by applicable specification sections within 30 days after award of Contract.
 - (4) Shop drawings shall be approved by Contractor and those Subcontractors whose work is associated with the subject equipment as being in accordance with Contract Documents, prior to submission.
 - (5) Where contents of submittal literature from manufacturers include data not pertinent to the submittal, clearly indicate which portion of the contents is not being submitted for review.
 - (6) Consecutively number all submittals. Accompany each submittal with a letter of transmittal showing the transmittal number, date, brief description of submittal, and the company name of the originator of the submittal. On at least the first page of each copy of each submittal, indicate the transmittal number, name of project, and City project number.
 - (7) When material is resubmitted for any reason, transmit under a new letter of transmittal with a new number, indicate by reference to previous submittal that this is a resubmittal. Make any corrections and resubmit the required number of corrected copies of Shop Drawings or new samples.
 - (8) Submit all samples of the exact article/material proposed to be furnished and in the quantity, which is required to be returned plus one which will be retained.
 - (9) Unless the precise color and pattern is specifically described in the Contract Documents, submit color charts and pattern charts for review and selection. A complete line of finish material samples and colors of same for the preparation of a project master color schedule shall be submitted at one time. Partial color selections will not be made.
 - (10) Failure to comply with these requirements will result in the submittal being returned unprocessed.
- C. **Schedule of Values:** Submit detailed Schedule of Values at least 10 days prior to first application for payment. The Owner or his representative must approve the Schedule of Values.
- D. **Construction Photographs:** The Contractor shall provide photographs or video tape of project of all areas to be disturbed prior to beginning construction and submitted immediately to Owner. At the end of construction, the Contractor shall provide another set of photographs or video tape documenting final restoration.

1.16 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Arrangements for access to the site, workmen's parking locations, sites for storing material, sanitary facilities, utilities during construction, etc., shall be coordinated by the Contractor with the Owner. The Owner agrees to make the _____ site accessible to the Contractor _____. To arrange for access at these or any other times permitted by the Owner, the Contractor shall be accompanied by City personnel for unlocking or locking the facility when leaving. No keys will be furnished for use by the Contractor.

Contact _____ at _____ for _____.

For individuals working at the _____, photo I.D. badges will be furnished by the City at no cost to the Contractor. The City will conduct background checks for all workers at the site. The Contractor shall furnish names and information for all individuals to do work within the building.

- B. Under no circumstances shall the Contractor, workmen, Subcontractors, etc., be allowed to use the Owner's telephone service.
- C. Project Identification: _____

1.17 MATERIALS AND EQUIPMENT

- A. **Quality:** Material and Equipment Incorporated into the Work:

- (1) Conform to applicable specifications and standards.
- (2) Comply with size, make, type, and quality selected, or as specifically approved in writing by the Owner.
- (3) Do not use material or equipment for any purpose other than that for which it is designed or is specified.
- (4) When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation. Maintain one set of complete instructions at the job site during installation and until completion. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformity with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with the Owner for further instructions. Do not proceed with work without clear instructions. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

B. Transportation and Handling

- (1) Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the Work. In the event specified items will not be available, notify the Engineer prior to submission of bids. Costs of delays because of non-availability of specified items, when not identified by the Contractor prior to submission of bids shall not be borne by the Owner.
- (2) Arrange deliveries of products in accordance with construction schedules. Coordinate to avoid conflict with work and conditions at the site. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
- (3) Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

C. Storage and Protection

- (1) Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store products subject to damage by the elements in weathertight enclosures. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- (2) **Exterior Storage:** Store fabricated products above the ground, on blocking or skids; prevent soiling or staining; cover products which are subject to deterioration with impervious sheet coverings; and provide adequate ventilation to avoid condensation.
- (3) Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.

D. Project Substitutions

- (1) Trade names, brand names and/or manufacturer's information used in these specifications are for the purposes of establishing quality. Bids on products or other qualified manufacturers are acceptable provided request is made in writing not less than ten (10) days prior to scheduled receipt of bids, and, if approved:
 - (a) No major changes in the construction, design intent, or to any services or modifications to other equipment of the project would be required. Changes required to accommodate substituted items or the cost to repair and damage resulting from effecting such changes or

modifications made necessary or caused by substitution shall be made by the Contractor at no additional cost or time delay.

- (b) Features of quality, capacity, construction, performance, appearance, size, arrangement, and general utility including economy of operation of substitutes offered, either parallel or exceed those of specified products.
- (c) The provisions of the General Conditions and any other guarantees, if required by the specification sections, shall apply in full force and effect to the performance of such substitute products, approved for incorporation into the work.

- (2) Technical data covering the proposed substitution shall be furnished with the request.

1.18 TESTING

Tests called for by other than public authorities shall be made by approved independent laboratories with the full cooperation of the Contractor. The laboratory charges shall be borne by the Contractor unless otherwise specified. Testing services other than those called for in these contract documents may be called for by the Owner to check compliance with specifications, the testing service charges will be borne by the Owner, but when non-compliance with specification is indicated, the testing service charges will be deducted from the Contract Sum.

1.19 PUBLIC CONVENIENCE

The Contractor shall at all times conduct his work as to insure the least possible inconvenience to the general public and the residents in the vicinity of the work. Fire hydrants on or adjacent to the work shall be kept accessible to fire fighting equipment at all times. Temporary provisions shall be made by the Contractor to insure the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the City Engineer.

1.20 UTILITIES

- A. Existing utilities shall be located, protected, and rerouted as necessary during construction. All utilities affected by construction shall be relocated or replaced in a workmanlike manner.
- B. The Contractor shall be responsible for anticipating and locating underground utilities and obstructions. When construction appears to be in close proximity to existing utilities, the trench(es) shall be opened a sufficient distance ahead of the work or test pits made to verify the exact locations and inverts of the utility to allow for changes in line and grade.

- C. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
- D. It is not the intent of these specifications to identify each existing utility, but the responsibility of the Contractor to maintain, repair, or restore all utilities. Contractor shall be responsible for the cost of any damages to utilities caused by the construction.
- E. The Contractor will not be compensated for any additional expenses incurred or delays due to utility conflicts. However, the construction schedule may be adjusted accordingly at the discretion of the City Engineer.

F. Coordination

Phases of the construction which involve the temporary interruption of essential services shall be scheduled in consultation with the Owner or his representative and shall not be of longer duration than essential to accomplish the purpose for such interruptions. Advance notice of at least 48 hours shall be given to the Owner when the Contractor requires interruption of water service.

The City shall open and close all water line valves as needed for construction upon 48-hour notification from the Contractor.

G. Protection of Utilities

- (1) Location of any utility shown on the plans is approximate. The Contractor is responsible for the protection of all utilities and shall comply with Title 56, Chapter 10.3 of the Code of Virginia, concerning utilities "Underground Utilities Damage Prevention Act," or current revisions.

Take necessary precautions to protect existing utilities from damage due to any construction activity. The Contractor shall locate existing utilities, culverts, and structures (above or below ground), before any excavation starts and coordinate work with utility companies. Protect, maintain in service, and prevent damage to utilities not designated to be removed. Omission from or inclusion of located utility items on plans does not constitute non-existent or definite location. Secure and examine local utility surveyor records for available location data including building service lines. Contact underground damage protection services by contacting **MISS UTILITY** at least 48 hours before you dig at 1.800.552.7001, as required.

The Contractor shall protect, maintain in service, and prevent damage to utilities not designated to be removed. When utilities are encountered and are not shown on drawings or when locations differ from those shown on drawings, notify the City Engineer for instruction before proceeding. In the event that a gas line, water line, sewer line, storm line, power cable or conduit, or telephone cable or conduit is broken or damaged, the Contractor shall give immediate notice to the proper authorities and shall be responsible for any damage to persons or property caused by such breaks. If a service pipe to an adjoining house is broken, the Contractor shall repair same at once and at his expense. The City may, at the Contractor's expense, repair any such service without prior notice to Contractor.

Should it become necessary to move the position of any underground structure, the Contractor may be required to do such work and shall be paid on an extra work basis.

The Contractor shall be responsible for protecting all existing utilities that could be damaged by excavation near the proposed line. Trench boxes may be necessary to prevent sloughing, etc., as well as to protect workmen, the motoring public, and the pavement. Failure to use a box, which subsequently results in damage to an existing line or other public improvements, shall be cause for liability against the Contractor for the repair costs.

Construction may require work on private property. When this occurs, it shall be the responsibility of the Contractor to contact the individual private property owner for exact location of the underground utilities or services prior to any excavation on the property.

Construction may require the relocation of some existing utilities. Contractor shall coordinate any such relocation necessary for the construction with the respective utility owner. City shall be responsible for cost of relocation of utilities if applicable.

Contractor shall be responsible for cost of any damages to utilities caused by the construction, and may be required to perform repairs at the City's request.

- (2) Some work under this contract may involve work in close proximity to overhead high voltage lines, when this is the case, *"The Overhead High Voltage Line Safety Act,"* Title 59.1, Chapter 30 of the Code of Virginia will apply. Before any work involving high voltage overhead lines is anticipated or encountered, the Contractor must first request the Power Company to make safety arrangements to protect his workers and the lines. The actual expense incurred by the Power Company in taking these precautionary measures shall be paid by the person responsible for the work. The City will consider these charges and pay them as an add-on to the project.

H. Protection of Surface Features

- (1) Whenever the utility line is to be placed in or near a paved street, the Contractor shall provide pads or take necessary precautions to protect the pavement from damage by the construction equipment. Pavement damaged by cleated or tracked equipment, or by any other means, shall be repaired by the Contractor at his expense.
- (2) Where a utility line is in an existing paved area, the edges of the pavement for the utility line shall be cut in a straight line, parallel to the pipe on each side. A straight and vertical cut shall be made either prior to excavation or after, but before installation of the permanent pavement repair.
- (3) Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property.
- (4) Provide full access to public and private premises, to fire hydrants, at street crossings, sidewalks and other points as designated by City to prevent serious interruption of travel.
- (5) Protect and maintain bench marks, monuments, or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of City.

I. Procedures for Repairing Damaged Utilities

- (1) If a located or unlocated service is interrupted as a result of work under this Section, immediately notify the governing utility owner of said interruption and await instruction from utility owner. The Contractor is responsible for all costs incurred due to damage of the utilities.
- (2) **Service Laterals:** If a water or sewer service pipe is broken, the Contractor shall repair same at once and at his expense. The City may, at the Contractor's expense, repair any such service without prior notice to the Contractor.

J. Bracing Trenches

The Contractor will be required to furnish all trench boxes, shoring, bracing, etc. where necessary and in accordance with generally accepted construction practices. Where adjacent utilities may be damaged, vertical trench walls may be necessary. When so warranted, the Contractor shall furnish, at no additional cost, all bracing, sheeting, shoring, trench boxes, etc. necessary to carry out the intended work. Conform to the requirements of Title 29 Labor, Part 1518 - "Safety and Health Regulations for Construction" and detailed requirements of Subpart P "Excavations, Trenching and Shoring," latest edition regarding trench protection requirements. NO compensation will be made for compliance with OSHA requirements. When OSHA regulations require work in addition to our minimum standards, no compensation will be made.

- K. **Encroachment Permits:** All crossings under VDOT system roads shall be made in accordance with the requirements of the VDOT as outlined in the encroachment permit(s). No extra compensation will be allowed.
- L. **Railroad Permits:** If installation is in Railroad right of way, all permits shall be obtained and Railway Company shall be notified prior to installation.
- M. **Roadway crossings:** If installation is in a City of Lynchburg right of way, all permits shall be obtained and the City of Lynchburg shall be notified prior to installation.

1.21 **SAFETY**

Contractor to conform to all OSHA regulations for all construction on City of Lynchburg projects.

1.22 **DUST CONTROL**

The Contractor shall be required to sprinkle with water or to apply dust allaying materials in the vicinity of dwellings, schools, churches, stores, or other places, where in the opinion of the City Engineer, this is necessary to ensure that dust is held to an absolute minimum. Dust control is considered incidental and shall be carried out at the Contractor's expense.

1.23 **OWNER OCCUPANCY**

The Owner is now occupying and operating in the building and will continue to do so during the progress of the work covered by this Contract. The Contractor shall plan his work to minimize disruption of normal operating procedures and shall cooperate fully and coordinate his work with Building Management in all aspects, including, but not limited:

- A. Coordinate with the building management all construction effecting occupied areas of the building. Some work in occupied areas and above occupied areas may need to be performed during non-working hours to accommodate the Owner's operations. The Contractor, Owner, and Building Management will confer on an acceptable schedule for the entire project, including a schedule required for work during such hours.
- B. Keep all passages to and in the building open and free from obstructions at all times for the use of employees, public, and staff of the Owner and provide ample protection of existing equipment and apparatus, as well as the employees, staff, and public, against the elements and possible harm or injury from any operations of the Contractor during the entire period of construction.
- C. The existing building interior and all furnishings and equipment to remain in the construction areas shall be protected from weather, dust, and dirt at all times during the construction.

- D. Existing services must be maintained for the Owner's occupancy. Aspects of the construction, which involve the temporary interruption of essential services shall be scheduled in consultation with the Owner and Building Management and shall not be of longer duration than essential to accomplish the purpose of such interruption.
- E. Contractor shall take precautions as necessary to prevent migration into existing occupied facility of noxious, irritating or hazardous fumes and gases. When sealants, adhesives, compounds, cleaners, lubricants, paints, etc., are to be applied, provide adequate exhaust to exterior of building away from air intakes or arrange to accomplish such work during non-working hours. Provide fresh air ventilation as required to work safely in confined areas.
- F. **Dust Control:** Contractor shall ensure that dust is held to an absolute minimum along all portions of the work. Erect temporary partitions as required.
- G. Operations which require the use of machines which produce excessive noise such as rotary hammers, jack hammers, etc., as well as machines which will produce structural vibrations shall be coordinated with the Owner and/or Building Management prior to execution.
- H. The Owner reserves the right to place and install equipment in completed areas of the building and to occupy completed areas prior to substantial completion, provided that occupancy does not interfere with completion of the work.

1.24 **ROOFING PROTECTION**

All work affecting the roofs of the buildings shall be coordinated with the Owner. Protection will be discussed further during the Preconstruction Meeting.

1.25 **SITE SECURITY**

Caution shall be maintained by the Contractor to ensure the building is secured at all times. Security measures shall be coordinated with the Building Management.

1.26 **ASBESTOS SURVEY**

As required by Title 36-99.7 of the Code of Virginia, the City has conducted an asbestos survey. Upon request, this survey will be provided to the Contractor.

1.27 **PROTECTIVE EQUIPMENT**

Use of protective equipment (e.g. safety harnesses, hoists, breathing apparatus) is required when working inside manholes in accordance with current OSHA guidelines.

1.28 TRAFFIC CONTROL

It shall be the sole responsibility of the Contractor to furnish and maintain, until the work has been accepted by the City, any and all signs, lights, barricades, flashing directional arrows, flagmen, etc. necessary for the safety of the general public, including both vehicular and pedestrian traffic.

The Contractor shall furnish, install, and maintain amber warning lights at all locations necessary for the control and protection of vehicular traffic. Warning lights placed at or on warning signs shall be flashing lights. Warning lights used for delineation of traffic and at locations of hazardous construction shall be steady-burn lights. Amber warning lights shall battery power lights conforming to the Institute of Transportation Engineers (ITE) Standard for Flashing and Steady-Burn Barricade Warning Lights.

When working within any City right of way, traffic control shall conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices, latest revision (MUTCD) as well as the VDOT Road and Bridge Specifications, latest revision.

Traffic Maintenance shall comply with the latest revision of the VDOT Road and Bridge Specifications, Section 512 – Maintaining Traffic, and Section 701 – Traffic signs, as well as other applicable sections. All costs for maintenance of traffic shall be included in other bid items of the contract.

A copy of the MUTCD Manual is available for the Contractor's review in the Office of the City Engineer, Public Works, City Hall, during normal hours. It shall be the responsibility of the Contractor to be familiar with the manual and its application to his projects.

While working in street rights-of-way, traffic is to be maintained in such a manner as to provide safe passage of the public through the construction project at all times. Flagging should only be employed when required to control traffic or when all other methods of traffic control are inadequate to warn and direct drivers. Flaggers must be certified as having taken the VDOT Flagging Course and have the certification card with them while flagging. At least one lane of traffic shall be maintained at all times. While work is not in progress, traffic is to be returned to the normal fashion. When two-way traffic is required, the Contractor shall construct within the right of way suitable detours around the work.

When traffic signals or their appurtenances are likely to be damaged or interfere as a result of the construction, coordinate temporary operation with the City of Lynchburg Traffic Engineer unless otherwise approved by City of Lynchburg Traffic Engineer. Provide 7 days notice prior to anticipated disturbance or interruption.

Whenever it becomes necessary to leave a section of trench open after completion of the days work, the Contractor shall provide barricades and lights to protect the public. Operate warning lights during hours from dusk to dawn each day and as otherwise required for inclement weather and visibility. Approval from City Engineer shall be acquired prior to leaving trench open.

The Contractor shall promptly remove any excavated material or other debris that may be spilled or tracked onto the traveled pavement during the conduct of his work.

Upon all road closings and detours, the Contractor shall be responsible for notifying LynCom (847-1602) and City of Lynchburg Hotline (856-CITY) on a daily basis until such time the road is returned to normal operation.

The Contractor shall provide and place no parking signs on streets that are to be overlaid. These signs shall be placed not more than 36 hours in advance of resurfacing work and no less than 24 hours prior to work. Cost for placing these signs shall be included in other bid items, there will be no payment for the labor or equipment required to place these signs.

When roadwork is scheduled for major thoroughfares or expressways, the Contractor cannot obstruct the roadway before 8:30 a.m. or after 3:30 p.m.

1.29 **CONSTRUCTION STAKING**

Unless otherwise called for in the proposal, the Contractor is to provide and pay for all construction staking using the services of a Virginia Licensed Professional Surveyor familiar with construction staking procedures.

Construction surveying will be considered incidental to the construction and included in other bid items. This will be full compensation for performing the aforementioned work and for all materials, labor, tools, equipment, and incidentals necessary to complete the work.

All property pins or corners shown on plan or identified by property owners shall be referenced prior to start of construction and otherwise protected and any property corner removed shall be replaced by a Virginia Licensed Professional Land Surveyor at not additional cost. The Construction Coordinator shall be furnished a copy of each property corner reference. The Contractor shall protect and preserve all reference points and offset stakes and replace it at no additional cost if they are destroyed. Failure to reference property pins or destroying references will not relieve the Contractor of the responsibility of restoring the property corners.

Consideration will not be given for any delays to the project, which result from inaccurate stakeout or time lost for corrective action.

Upon completion of the project, the Contractor shall provide the Engineer with copies of all-original field notes, electronic field book files, worksheets, layouts, and computations in a standard notebook, or on disk.

1.30 **ROCK EXCAVATION**

Rock excavation shall consist of the removal and satisfactory disposal of all materials, which in the opinion of the Engineer, cannot be excavated except by drilling, blasting, wedging, “jack hammering or hoe ramming.” It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than one-half cubic yard will be classified as rock. When rock is encountered in the trench, the inspector or engineer must be notified before any rock has been blasted or removed. The engineer or his representative will measure the rock, after which, the rock shall be excavated to the depth required. Rock shall be removed from the construction site unless otherwise approved by the City Engineer.

1.31 **BLASTING**

- A. General Liability Insurance Certificate naming the City of Lynchburg, its officers, and employees as “additional Insured.” Certificate to include coverage for underground damage protection and collapse and be in the amount required by the blasting permit conditions as determined by the City Fire Marshall.
- B. Qualifications, proposed procedures, proposed storage locations, and schedule shall be submitted at least 2 weeks prior to commencing any blasting operations. Submittals shall be made to City Engineer and Lynchburg Fire Marshall.
- C. Blasters shall, at all times, have their license and blasting permits on the job site, and shall allow examination of same by any official that may have jurisdiction.
- D. If required by the City Engineer, submit seismic survey agency report for record purposes.
- E. **General**
 - (1) Blasting procedures shall conform to all applicable local, state, and federal laws and ordinances. Prior to any blasting, a blasting permit from the Lynchburg Fire Marshall shall be obtained. The approval of the City Engineer shall be obtained before any blasting takes place and the City Engineer may fix the hours of blasting if he/she deems it to be necessary. The Lynchburg Fire Marshall, Emergency Operations Center, and Construction Coordinator shall be notified a minimum of 48 hours in advance of any blasting per the approved blasting plan.
 - (2) The minimum insurance coverage for blasting shall be as annotated in Section 00815, Supplementary Conditions. The coverage shall include explosion and collapse. If blasting occurs within 200 feet of any underground structure, underground coverage will be required.

- (3) **Storage:** Store explosives in accordance with the Occupational Safety and Health Act and with other Federal, State and Local ordinances and regulations. The Contractor shall keep explosive materials that are on the job site in special constructed boxes provided with locks. These boxes shall be plainly identified as to their contents. Failure to comply with this specification shall be grounds for suspension of blasting operations until full compliance is made. No blasting shall be allowed unless a galvanometer is employed to check cap circuits.
- (4) The City of Lynchburg may prohibit blasting when the method of detonation or the means of protection provided is inadequate. Blasting conducted with or without direct supervision of the City of Lynchburg will not relieve the Contractor of the responsibilities stipulated herein.
- (5) Blasters shall not explode or attempt to explode blasting powder or high explosives unless it is performed with a suitable electric blasting machine. Electric current from batteries, telephone, or power lines shall not be used for detonation.
- (6) A minimum of 3 minutes prior to the detonation, the blaster shall inform competent flagmen, equipped with red flags, stationed at reasonable distances from the blast area at every avenue of approach, to warn all persons.
- (7) Immediately after the loading and tamping of the drill hole and before fixing the blast, the material to be blasted shall be covered on all exposed sides with blasting mats, or other approved protective material. After the protection has been applied, the blast shall be fired without unnecessary delay.

F. Minimum Blasting Procedures Required

- (1) The Contractor shall provide a blast warning signal system. The blast warning signal system shall consist of one or more air horns located at the blast site. The air horn(s) shall be audible a minimum of 1 mile from the blast site. The signals shall be one long horn 5 minutes prior to the blast, one short horn 1 minute prior to the blast, and one long horn after the blast to signal all clear. The Contractor shall erect two clear and legible blast warning signal signs at locations determined by the City Engineer. The signs shall list the blast warning signal system, the Contractor Superintendent's name and telephone number, and the City Construction Coordinator's name and telephone number.
- (2) The blasting shall be performed by a licensed blaster.
- (3) The Contractor shall notify in writing all property Owners within 250 feet of the proposed blast at least 1 week prior to the proposed blast and verbally on the day of the scheduled blast.

- (4) Blasting shall be limited to mid-morning hours on days of clear-to-partly cloudy skies with increasing surface temperature and light wind. The Contractor shall provide monitoring equipment to monitor all blasting. A copy of monitor record shall be given to the City Construction Coordinator daily.
- (5) The use of unconfined explosives shall be prohibited.
- (6) The maximum allowable peak particle velocity shall be 1.25 inches per second. For all structures located 0 to 300 feet from the blasting site, the maximum allowable peak particle velocity shall be 1.00 inch per second for all structures located 301 to 5,000 feet from the blasting site. The maximum allowable peak particle velocity shall be 0.75 inch per second for all structures located 5,001 feet and beyond from the blasting site.
- (7) To minimize vibration, minimum scaled distance (SD) of 50 shall be used to determine maximum explosive weight per delay. A test blast shall be conducted to verify the scaled distance. The maximum explosive weight per delay shall not exceed the distance from the blast to the nearest structure divided by 50 squared. Maximum explosive weight per delay may be revised pending outcome of test blast. Test blast monitoring shall be at the expense of the Owner. The recommendations indicated for blasting criteria in no way relieves the Contractor of his liability.
- (8) The peak overpressure of air blast shall not exceed 0.015 pound per square inch or 138 decibels.
- (9) Preblast meetings may be scheduled by the Engineer to document hole depths and spacing, charge weight per delay, shot scheduling, and weather conditions. The Contractor shall obtain accurate measured distances from structures to center of blast area prior to determining the safe maximum charge-weight per delay and loading blast holes.
- (10) Preblast and post blast surveys will be performed by the independent Contractor designated or approved by the City. The Contractor may review this data and supplement it as he sees fit or conduct separate survey after written permission is obtained from the property Owners. In this event, the written permission shall be submitted to the Engineer prior to entering upon private property. The preblast and post blast surveys will include all occupied buildings within 250 feet of blasting areas. The Contractor is strongly encouraged to have a representative present during these surveys. The preblast and post blast surveys performed by the Owner in no way relieve the Contractor of his liability. A copy of the surveys shall be furnished to the City Engineer.
- (11) The City reserves the right to monitor production blasting.
- (12) A seismograph reading shall be taken during each blast. Seismograph shall be equipped with a recorder.

1.32 DITCH REGRADING

When construction is at or near roadside ditches, the Contractor shall re-grade the shoulder and ditches to a condition equal to or exceeding the pre-construction condition.

1.33 PROTECTION AND RESTORATION OF PROPERTY

The Contractor shall not enter upon private property for any purpose without first obtaining permission from the Property Owner. He shall use every precaution necessary to prevent damage or injury to any public or private property, trees, fences, monuments, and underground structures, etc., on and adjacent to the site of the work. He shall protect carefully from disturbance or damage all land monuments and property markers until an authorized agent has witnessed or otherwise referenced their locations and shall not remove them until directed.

The Contractor shall be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in his manner or method or executing said work, from his nonexecution of work, or from defective work or materials, and he shall not be released from said responsibility until the work shall have been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, he shall restore such property, at his own expense, to a condition equal to or better than that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring to the approval of the property owner and City Engineer.

1.34 CLEANUP AND RESTORATION OF SITE

Maintain the site in a neat and orderly condition at all times. Provide adequate storage for all items waiting removal from the site. Debris must be removed from within any building involved in the project on a daily basis.

At all times, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site; and shall keep the site free of mud and dust to the satisfaction of the City Engineer. It is important that cleanup and restoration of the site follow the work closely. The Contractor shall dispose of surplus material and clean the street at the end of each day for the portion of work completed that day. After all work is completed, the Contractor shall remove all tools and other equipment, leaving the site free, clean, and in good condition.

1.35 SEEDING AND GROUNDCOVER, EROSION AND SEDIMENT CONTROL

- A. Landscaping Materials shall comply with Sections 204, 244, and 245 – *Roadside Development Materials* of the Virginia Department of Transportation, *Road and Bridge Specifications*.
- B. Rip rap shall comply with Sections 204 and 414 of the Virginia Department of Transportation, *Road and Bridge Specifications*.

- C. Preparation and application of seeding and ground cover shall comply with Sections 602 through 608 of the Virginia Department of Transportation, *Road and Bridge Specifications* which covers topsoil, seeding, sodding, planting, soil retention coverings, and Herbicide spraying.

1.36 EROSION AND SEDIMENT CONTROL

Erosion Control design, procedures, and application of measures shall comply with the requirements of the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, *Virginia Erosion and Sedimentation Control Handbook*, latest edition.

1.37 USE OF COMPLETED PORTIONS

The Owner shall have the right to use, occupy, or place into operation any portion of the work that has been completed sufficiently to permit safe use, occupancy, or operation, as determined by the Engineer. Such use or occupancy shall not be construed to be an acceptance of the work.

1.38 CONTRACT CLOSEOUT

Contract Closeout shall include the following items prior to submission of final Application for Payment by the Contractor:

- A. Correct all punch list items.
- B. Schedule a final cleaning as approved by the Engineer to enable the Owner to accept a completely clean project. Clean up all debris; remove stains, spots, marks, and dirt; remove paint spots and smears from all surfaces; and clean fixtures. Remove all machinery, equipment, and surplus material.
- C. Provide one complete set of drawings and project manual recording all changes to the work to indicate actual installation. All addenda items, bulletin drawings, change order items, field changes, and items changed during project meetings shall be included on the Record Drawings. Changes shall be noted in legible red letters at least 1/8 inch high. These records are a specific Contract requirement, and final payment will not be made until these drawings and project manual have been submitted in an acceptable form.
- D. Submit three copies of all operating and maintenance manuals. Manuals shall be in durable plastic binders approximately 8-1/2" x 11" in size and with at least the following:
 - (1) Identification on or readable through the front cover stating general nature of the Manual.
 - (2) Neatly typewritten index near the front of the Manual.

- (3) Complete instruction regarding operation and maintenance of all equipment involved.
 - (4) Complete nomenclature of all replaceable parts, their part numbers, current cost and name and address of nearest vendor.
 - (5) Copy of all guarantees and warranties.
 - (6) Copy of approved shop drawings with all data concerning all changes made during construction.
 - (7) All manufacturers' catalog pages clearly marked to indicate precise items included in the installation and all other items deleted or otherwise clearly indicated that they are not part of the installation.
- E. At the conclusion of the project, the Contractor shall submit a complete list of Subcontractors, manufacturers, and suppliers who participated in the construction or who furnished materials or equipment. The address of each firm shall be included, together with types of materials or work performed.
- F. Statement of payment of taxes.
- G. Affidavit of Payment of Debts and Claims.
- H. Affidavit of Release of Liens.

1.39 **GUARANTEE**

The Contractor shall guarantee all work under this contract against defective materials, defective workmanship, or failure to perform any work shown or stated within the plans or specifications for a period of 12 months after the completion and acceptance of all, or any part of the project, by the City. The surety underwriting the contract bond shall include such guarantee as a part of the contract bond.

PART 2 - MATERIALS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION 01000

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SECTION 01200 – MEASUREMENT AND PAYMENT

(Revised 10/25/04)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

[Earthwork](#)

[Trenching, Backfilling & Compaction](#)

[Sanitary Sewer](#)

[Water Distribution](#)

Measurements for purposes of payment shall be in accordance with the unit quantities stated in the proposal as defined below. Prices for the following bid items shall include all labor, materials, tools, equipment, and other incidentals necessary to complete the work as shown on the plans and in accordance with The City of Lynchburg Manual of Specifications and Standard Details.

1.1 TRENCHING, BACKFILLING & COMPACTION OF UTILITIES

A. Pavement Cut and Removal, Asphalt Concrete:

Measurement: Asphalt concrete pavement cut and removed will be measured in square yards regardless of the existing pavement depth. Refer to **Standard Details 25.18, 26.01, and 27.01** for calculation of pavement removal dimensions for utility trench patches.

Payment: Asphalt concrete pavement cut and removed will be paid for at the contract unit price per square yard for bituminous pavement cut and removed, including all material, equipment, and labor to saw cut pavement, remove and dispose of surplus material.

B. Pavement Cut and Removal, Unreinforced Concrete:

Measurement: Unreinforced concrete pavement cut and removed will be measured in square yards regardless of the existing pavement depth. Refer to **Standard Details 25.19, 26.01, and 27.01** for calculation of pavement removal dimensions for utility trench patches.

Payment: Unreinforced concrete pavement cut and removed will be paid for at the contract unit price per square yard for unreinforced concrete pavement cut and removed, including all material, equipment, and labor to saw cut pavement, remove and dispose of surplus material.

C. Pavement Cut and Removal, Reinforced Concrete:

Measurement: Reinforced concrete pavement cut and removed will be measured in square yards regardless of the existing pavement depth. Refer to **Standard Details 25.19, 26.01 and 27.01** for calculation of pavement removal dimensions for utility trench patches.

Payment: Reinforced concrete pavement cut and removed will be paid for at the contract unit price per square yard for reinforced concrete pavement cut and removed, including all material, equipment, and labor to saw cut pavement, remove and dispose of surplus material.

D. Extra Depth Excavation – All Pipes:

Measurement: Extra depth excavation for pipelines will be measured by the cubic yard. Refer to **Standard Details 26.01 and 27.01** for trench width and depths allowed in calculated Extra Depth Excavation.

Payment: Extra depth excavation will be paid for at the contract unit price per cubic yard for extra depth excavation and shall include all material, equipment, and labor required for excavation. The price shall also include all shoring, trench boxes, dewatering, traffic control, and safety devices required.

E. Foundation Stone:

Measurement: Foundation stone for pipelines will be measured by the cubic feet of foundation stone placed in the trench in accordance with **Standard Details 26.01 and 27.01**. Trench width shall also be measured in accordance with **Standard Details 26.01 and 27.01**. Cubic feet of foundation stone material placed will be converted to tons using the weight of 145 pounds per cubic feet.

Payment: Foundation stone will be paid for at the contract unit price for foundation stone by the ton. Price shall include removal and disposal of unusable material and placement of stone, complete in place.

F. Bedding Stone:

Measurement: Bedding stone for pipe bedding will be measured by the cubic feet of pipe bedding material placed in the trench in accordance with **Standard Details 26.01 and 27.01**. Trench width shall also be measured in accordance with **Standard Details 26.01 and 27.01**. Cubic feet of bedding material calculated will be converted to tons using the weight of 145 pounds per cubic feet.

Payment: Bedding stone will be paid for at the contract unit price per ton for placement of stone, complete in place.

G. Compacted Aggregate Backfill:

Measurement: Compacted aggregate backfill will be measured by the cubic feet of material placed in accordance with Standard Details 26.01 and 27.01. Trench width shall also be measured in accordance with these details. Cubic feet of material calculated will be converted to tons using the weight of 145 pounds per cubic foot.

Payment: Compacted aggregate backfill will be paid for at the contract unit price per ton for aggregate backfill and shall include all materials, equipment, and labor required to furnish and compact, complete in place, VDOT No. 21A stone in the locations designated by the City Engineer.

H. Coarse Granular Aggregate Backfill:

Measurement: Coarse granular aggregate backfill will be measured by the cubic feet of material placed in accordance with **Standard Details 26.01 and 27.01**. Trench width shall also be measured in accordance with these details. Cubic feet of material calculated will be converted to tons using the weight of 145 pounds per cubic foot.

Payment: Coarse granular aggregate backfill will be paid for at the contract unit price per ton for aggregate backfill and shall include all materials, equipment, and labor required to furnish and consolidate, complete in place, VDOT No. 57 stone in the locations designated by the City Engineer.

I. Trench (Select) Borrow Backfill:

Measurement: Trench borrow will be measured by the cubic yard of material installed in the trench, limiting the trench width to a maximum of the pipe outside diameter plus 2 feet.

Payment: Trench borrow will be paid for at the contract unit price by the cubic yard and shall include all material, equipment, and labor to furnish, haul, place, and compact the approved material, complete in place, in the locations as designated on the drawings or as approved by the City Engineer.

J. Trench Rock:

Measurement: Trench rock excavation will be measured by the City Engineer or his representative in its original position, after which the rock shall be excavated to the depth specified by the City Engineer and then measured by the cubic yard. Refer to **Standard Details 26.01 and 27.01** for allowable width of rock removal in trench. Rock excavation shall consist of the removal and satisfactory disposal of all materials, which in the opinion of the Engineer, cannot be excavated except by drilling, blasting, "jack hammering or hoe ramming." No payment shall be made for rock removal by ripping. It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than one-half cubic yard will be classified as rock.

Payment: Trench rock excavation will be paid for at the contract unit price per cubic yard for rock excavation and shall include all labor, materials, and equipment to excavate and dispose of rock off site.

K. Trench Patching for New Pipe Installation – Permanent and Temporary:

See Section 1.6 Base Course & Paving

L. Excavation and Backfill:

Measurement and Payment: In accordance with Section 02220, *Trenching, Backfilling, and Compaction of Utilities*, all excavation and backfill, excluding select borrow backfill, shall be included in the cost of the other items bid – not a pay item.

M. Maintenance Stone for Pipe Installation:

Measurement: Maintenance stone for pipe installation will be measured by the cubic feet of material placed per the direction of the City Engineer's representative. Cubic feet of material calculated will be converted to tons using the weight of 145 pounds per cubic foot.

Payment: Maintenance stone for pipe installation will be paid for at the contract unit price per ton for aggregate backfill on a one time basis and shall include all materials, equipment, and labor required to furnish and compact, complete in place, VDOT No. 21A stone in the locations designated by the City Engineer.

1.2 SANITARY SEWER**A. Sewer Pipe (including Carrier Pipe):**

Measurement: Sewer pipe will be measured from the exact beginning of the pipe to the end of the line. No deductions in length will be made for branches and appurtenances along the line.

Payment: Sewer pipe will be paid for at the contract unit price per linear foot for pipe of the type and size specified, complete in place (excluding stone bedding), at the 4-foot minimum depth to top of pipe. This price shall include trench excavation (excluding rock), shoring or use of trench box, installation, pumping, backfilling, compaction, metallic locating tape, testing of failed trenches, disposal of excess material, pressure testing.

B. Bored and Jacked Sewer Pipe:

Measurement: Bored and jacked sewer pipe of the type and diameter specified will be measured by the linear foot that is installed by the boring and jacking method.

Payment: Bored and jacked sewer pipe will be paid for at the contract unit prices per linear foot per diameter per type of pipe bored and shall include any and all excavation, including the boring pit, any backfill, dewatering, etc., complete in place. However, the bore shall be paid one time on a linear foot basis and no extra compensation will be paid for failures and the subsequent withdrawal and re-jacking attempts.

C. Encasement Pipe (Bored):

Measurement: Steel casing pipe of the wall thickness and diameter specified will be measured by the linear foot of steel casing pipe installed.

Payment: Steel casing pipe will be paid for at the contract unit prices per linear foot per diameter per thickness for steel casing pipe bored, complete in place. However, the bore shall be paid one time on a linear foot basis and no extra compensation will be paid for failures and the subsequent withdrawal and re-jacking attempts. Lines either off on grade or alignment shall be rejected or corrected in a manner approved by the City Engineer. Carrier pipe shall be paid for separately.

Encasement of sewer lines by the dry bore and jacking method shall include any and all excavation, including the boring pit, any backfill, the encasement pipe, bore, jacking, spiders, drain pipe, french drain, the end seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

D. Encasement Pipe (Open Cut):

Measurement: Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Payment: Steel casing pipe will be paid for at the contract unit prices per linear foot per diameter per thickness for steel casing pipe installed by the open cut method, complete in place. Carrier pipe shall be paid for separately.

Encasement of sewer lines by the open cut method shall include any and all excavation, including, any backfill, the encasement pipe, spiders, drain pipe, french drain, the end seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

E. Tunneling:

Measurement: Tunneling will be measured by the linear feet of tunnel installed.

Payment: Tunneling will be paid for at the contract unit price per linear foot for diameter installed. Lines either off on grade or alignment shall be rejected or corrected in a manner approved by the City Engineer. Carrier pipe shall be paid for separately.

The tunneling method shall include any and all excavation, including the boring pit, any backfill, steel liner plates and bolts, ventilation system for workers, lagging, spiders, grout plugs, sand-cement grouting of voids, steel drain pipe, french drain, concrete paved invert, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

F. Manholes - Standard:

Measurement: Standard manholes will be measured by the vertical foot of the manhole constructed. Manholes shall be measured from the lowest point of the invert to the top of the concrete casting and recorded to the nearest ½-foot.

Payment: Standard manholes will be paid for at the contract unit price per vertical foot, complete in place including excavation. Price shall include complete invert pouring and forming of concrete in accordance with the standards and drawings, rubber boots, bedding stone, bolting castings to cone, gaskets, vent pipe if required, vacuum testing, backfill, and compaction. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

G. Manholes – Drop (Interior and Exterior):

Measurement: Drop manholes will be measured the same as for a standard manhole in vertical feet of manhole constructed plus, a separate measurement per vertical foot per drop height as shown on **Standard Details 27.04 and 27.05**. The drop height shall be from invert of the lower line to invert of the upper line.

Payment: Drop manholes will be paid in vertical feet at the contract unit price of regular manhole plus a separate payment per linear foot for drop height (DH) as shown on **Standard Details 27.04 and 27.05** and measured from the invert of lower line to the invert of upper line including pipe, bends, concrete, bedding stone, and excavation. Price is to include strapping to casting (as applicable), concrete, tees, elbows, plugs/caps, stone, backfill and compaction, complete in place. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

H. Manholes – Doghouse:

Measurement: Doghouse manholes will be measured the same as for a standard manhole in vertical feet of manhole constructed. Manholes shall be measured from the lowest point of the invert to the top of the concrete casting and recorded to the nearest ½-foot.

Payment: Doghouse manholes will be paid for at the contract unit price per vertical foot, complete in place, including excavation. Price shall include pouring of concrete footing and invert, invert forming in accordance with the standards and drawings, bedding stone, bolting castings to cone, gaskets, vent pipe if required, vacuum testing, backfill, and compaction. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

I. Manhole Precast Concrete Riser Ring:

Measurement: Manhole precast concrete riser rings, as shown on **Standard Details 25.08 and 27.02**, will be measured from the top of the precast structure to the bottom of the frame, on a vertical foot basis.

Payment: Manhole precast concrete riser rings will be paid for at the contract unit price per vertical foot, complete in place, and shall include all labor, material, and equipment necessary to adjust the height of the manhole frame and cover by inserting a precast concrete riser ring on top of the manhole and sealing the joint with mastic and non-shrink grout.

J. Manhole Frames and Covers – Standard and Waterproof:

Measurement: Manhole frames and covers will be measured on an each basis.

Payment: Manhole frames and covers will be paid for at the contract unit price per each, complete in place, as shown on **Standard Details 27.10 and 27.11**.

K. Appurtenances:

Measurement: Wye Branches, tees, bends, etc. will be measured by the number of units installed of each size.

Payment: Wye branches, tees, bends, etc. will be paid for at the contract unit price per each, complete in place for each size.

L. Building Connection Service Pipe:

Measurement: Building connection service pipe will be measured from the outside end of the wye or 45-degree bend to the combination wye for the cleanout, in linear feet.

Payment: Building connection service pipe will be paid for at the contract unit price per linear foot per size of pipe, complete in place for a 4-foot depth above top of pipe including metallic locating tape. All depths greater than 4 feet will be paid as "extra depth excavation." Any temporary pumps required to by-pass sewer around work areas shall be provided at no additional cost.

M. Cleanout Assembly:

Measurement: Cleanout assemblies will be measured on an each basis. No measurement will be made for the following items that are included in the cleanout assembly measurement: combination wye, adapter, and plug, 45-degree bend, and cleanout assembly.

Payment: Cleanout assemblies will be paid for at the contract unit price per each for cleanout assemblies per size and shall include all labor, material, equipment necessary for installation, complete in place.

N. Cleanout Vertical Pipe:

Measurement: Cleanout vertical pipe will be measured from top of the combination wye to cap in linear foot.

Payment: Cleanout vertical pipe will be paid for per linear foot per size at the contract unit price, complete in place, including excavation, all materials, labor, and equipment and shall include full compensation for any final adjustments to grade once finish grade is established.

O. Lampstack Vertical Pipe:

Measurement: Vertical pipe for lampstacks will be measured from the 45-degree bend to the cap, excluding the lampstack cap and concrete collar, in vertical feet.

Payment: Vertical Pipe for lampstacks will be paid for per linear foot per diameter of pipe at the contract unit price, complete-in-place, including excavation, all materials, labor and equipment and shall include full compensation for any final adjustments.

P. Lampstack Frame and Cover:

Measurement: Lampstack frame and covers will be measured on an each basis and includes the concrete collar and lampstack cap in accordance with **Standard Detail 27.13**.

Payment: Lampstack frame and covers will be paid for at the contract unit price per each and covers the frame and cover, concrete collar, and lampstack cap, complete in place, including all materials, labor, and equipment and shall include full compensation for any final adjustments.

Q. Service Saddles on Existing Lines:

Measurement: Service saddles for taps placed on existing lines will be measured on an each basis per size installed. See **Standard Detail 27.16**.

Payment: Service saddles for taps placed on existing lines will be paid for at the contract unit price per each, complete in place. Any temporary pumps required to by-pass sewer around work areas shall be provided at no additional cost.

R. Machine Core Existing Manholes:

Measurement: Machine core of existing manholes will be measured on an each basis.

Payment: Machine core of existing manholes will be paid for at the contract unit price per each. Price shall include all labor, equipment, and materials to machine core drill and install the neoprene flexible boot and adjustable band, complete in place.

S. Manhole Abandonment:

Measurement: Manhole abandonment will be measured on an each basis.

Payment: Manhole abandonment will be paid for at the contract unit price per each, complete in place in accordance with *Section 02730, Sanitary Sewer*.

T. Fernco Couplings:

Measurement: Fernco couplings will be measured on an each basis of the size required.

Payment: Fernco couplings will be paid for at the contract unit price per each of the size required. Price shall include all labor, equipment, and materials to install the coupling, complete in place.

1.3 WATER DISTRIBUTION**A. Water Pipe (including Carrier Pipe):**

Measurement: Water pipe will be measured by the linear foot. All pipe will be measured from the exact beginning of the pipe to the end of the line without deduction for fittings (I.e. fittings and valves). Hydrant leads will also be measured as pipe.

Payment: Water pipe will be paid for at the contract unit price per linear foot of the type and size pipe specified, complete in place. This price shall include trench excavation (excluding rock), shoring, or use of trench box, installation, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing and chlorinating. Payment for mechanical joint pipe shall also include accessory kits.

B. Bored and Jacked Water Main Pipe:

Measurement: Bored and jacked water pipe of the type and diameter specified will be measured by the linear feet installed by the boring and jacking method.

Payment: Bored and jacked water pipe will be paid for at the contract unit prices per linear foot per diameter per type of pipe bored and shall include any and all excavation, including the boring pit, any backfill, dewatering, etc., complete in place. However, the bore shall be paid one time on a linear foot basis and no extra compensation will be paid for failures and the subsequent withdrawal and re-jacking attempts. Lines either off grade or alignment shall be rejected or corrected in a manner approved by the City Engineer.

C. Encasement Pipe (Bored):

Measurement: Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Payment: Steel casing pipe will be paid for at the contract unit prices per linear foot per diameter per thickness for steel casing pipe bored and shall include any and all excavation, including the boring pit, any backfill, dewatering, etc., complete in place. However, the bore shall be paid one time on a linear foot basis and no extra compensation will be paid for failures and the subsequent withdrawal and re-jacking attempts. Lines either off on grade or alignment shall be rejected or corrected in a manner approved by the City Engineer. Carrier pipe shall be paid for separately.

Encasement of water lines by the dry bore and jacking method shall include any and all excavation, including the boring pit, any backfill, the encasement pipe, bore, jacking, spiders, drain pipe, french drain, the end seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

D. Encasement Pipe (Open Cut):

Measurement: Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Payment: Steel casing pipe will be paid for at the contract unit prices per linear foot per diameter per thickness for steel casing pipe installed by the open cut method, complete in place. Carrier pipe shall be paid for separately.

Encasement of water lines by the open cut method shall include any and all excavation, any backfill, the encasement pipe, spiders, drain pipe, french drain, the end seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

E. Tunneling:

Measurement: Tunneling will be measured by the linear feet of tunnel installed.

Payment: Tunneling will be paid for at the contract unit price per linear foot for diameter installed. Lines either off grade or alignment shall be rejected or corrected in a manner approved by the City Engineer.

The tunneling method shall include any and all excavation, including the boring pit, any backfill, steel liner plates and bolts, ventilation system for workers, lagging, spiders, grout plugs, sand-cement grouting of voids, steel drain pipe, french drain, concrete paved invert, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

F. Valves:

Measurement: Gate valves, butterfly valves, double detector check valves and tapping valves, will be measured on an each basis of the size and type of valve installed.

Payment: Gate valves, butterfly valves, double detector check valves and tapping valves, will be paid for at the contract unit price, complete in place, per valve for the type and size specified. This price shall include providing and installation of valve box. Cost for accessory kit included in price of valve.

G. Valve Boxes : (not a pay item)**H. Air and Vacuum Release Valves:**

Measurement: Air and vacuum release valves will be measured on an each basis.

Payment: Air and vacuum release valves will be paid for at the contract unit price per air and vacuum valve for the size specified, complete in place. This price shall include the tap and/or saddle, brass corporation stop, valve, street ells and screen, (excluding the manhole and frame and cover), and other incidentals as shown on **Standard Detail 26.11**.

I. Wet Tap:

Measurement: Wet taps will be measured on an each basis.

Payment: Wet taps will be paid for at the contract unit price per tap for the size specified, complete in place. Wet tap price shall include furnishing all materials, equipment, and labor to make a wet tap on an existing line, to include valve, valve box, tapping sleeve, anchor blocks, excavations, backfill, and testing of sleeve.

J. Fire Hydrants (High Pressure and Low Pressure):

Measurement: Fire hydrants will be measured by the number of hydrants installed on an each basis.

Payment: Fire Hydrants will be paid for at the contract unit price per each to include all labor, materials, equipment necessary to install the hydrant including one-half cubic yard of VDOT #57 stone, accessory kits, fabric, testing and disinfecting, complete in place. When there is change in the plans, which results in the need for a longer extension of the fire hydrant barrel, the extension beyond the depth of 4 feet shall be paid for at the contract unit price per vertical foot of barrel for the fire hydrant extension. No additional compensation will be made for hydrants located on either high or low pressure systems.

K. Fire Hydrants Pads:

Measurement: Fire hydrant pads will be measured on an each basis.

Payment: Fire hydrant pads will be paid for at the contract unit price per each to include all labor, materials, equipment necessary to install the hydrant pad, complete in place, including placement and compaction of 4 inches of VDOT #21A stone and placement of a 4' x 4' x 4" concrete pad. See **Standard Detail 26.09**.

L. Installation of Fire Hydrants on Existing Water Mains:

Measurement: Installation of fire hydrants on existing mains will be measured accordingly with each specific line item used for such installation. For example, items such as fire hydrants, pipe, pavement cuts, fittings, seeding and grading, etc. shall be measured under appropriate item description.

Payment: Installation of fire hydrants on existing mains will be paid for accordingly with each specific line used for such installation. For example, items such as fire hydrants, pipe, pavement cuts, fittings, seeding and grading, etc. shall be paid under appropriate item description.

M. Relocation of Existing Fire Hydrants:

Measurement: Relocation of an existing fire hydrant by the method of removing and reinstalling a city owned fire hydrant at another location will be measured on an each basis.

Payment: Relocation of an existing fire hydrant by the method of removing and reinstalling a city owned fire hydrant at another location will be paid for on an each basis, at a lump sum price that is agreed upon and approved by the City Engineer prior to commencing any work.

N. Fittings and Accessories:

Measurement: Fittings and accessories will be measured by the pound.

Payment: Fittings and accessories will be paid for at the contract unit price by the pound based on AWWA C110/ANSI 21.10 published weights and shall include all material, equipment, and labor to install, test, disinfect, complete in place.

O. Flexible Couplings:

Measurement: Flexible couplings will be measured by the number of each size installed.

Payment: Flexible couplings will be paid for at the contract unit price per flexible coupling for the size specified, to include installation, complete in place.

P. Tie Rods, Meg-a-lugs, Retainer Glands and Retainer Clamps:

Measurement: Tie rods, meg-a-lugs, retainer glands, and retainer clamps will be measured in pounds of the specified size installed.

Payment: Tie rods, meg-a-lugs, retainer glands, and retainer clamps will be paid for at the contract unit price per pound for the type retainer specified, complete in place. The price shall include all nuts, bolts, eyebolts, gaskets, and special retainer washers required for assembly.

Q. Manholes for Air Release/Vacuum Valves and other Water Valves:

Measurement: Manholes for air release and vacuum valves and other water valves will be measured by the vertical height from the top of the footing to the bottom of the frame casting and recorded to the nearest ½ foot.

Payment: Manholes for air release and vacuum valves and other water valves will be paid for at the contract unit price per vertical foot for manholes, complete in place. The price shall include the concrete foundation and drainage material as shown on **Standard Details 26.11 and 26.07**. Cost for manholes is to include all installation, backfill, compaction, etc. The valve and the manhole frame casting are to be paid as separate items from the manhole.

R. Manhole Precast Concrete Riser Ring:

Measurement: Manhole precast concrete riser rings, as shown on **Standard Details 25.08 and 27.02**, will be measured from the top of the precast structure to the bottom of the frame, on a vertical foot basis.

Payment: Manhole precast concrete riser rings will be paid for at the contract unit price per vertical feet, complete in place, and shall include all labor, material, and equipment necessary to adjust the height of the manhole frame and cover by inserting a precast concrete riser ring on top of the manhole and sealing the joint with mastic and non-shrink grout.

S. Manhole Frames and Covers – Standard and Waterproof:

Measurement: Manhole frames and covers will be measured on an each basis.

Payment: Manhole frames and covers will be paid for at the contract unit price per each, to include bolting the frame and cover to the structure, complete in place, as shown on **Standard Detail 26.23**.

T. Vaults:

Measurement: Installation of vaults will be measured accordingly with each specific line item used for such installation. For example, items such as valves, fire hydrants, pipe, pavement cuts, fittings, formed concrete, etc. shall be measured under appropriate item description.

Payment: Installation of vaults will be paid for accordingly with each specific line item used for such installation. For example, items such as valves, fire hydrants, pipe, pavement cuts, fittings, formed concrete, etc. shall be paid for and include all work as defined under the appropriate costs for that item description. Any additional costs for an item that does not have a specific price or is not included in other costs must be approved by the City Engineer prior to commencing any work.

U. Water Meter Box and Assembly:

Measurement: Water meter box and assemblies will be measured on an each basis.

Payment: Water meter box and assemblies will be paid for at the contract unit price per size indicated on drawings, in terms of one complete box and meter connection assembly, and shall include excavations, backfilling, testing, chlorinating, bacteriological testing, meter box, angle valve, iron yoke, yoke ell, cast iron top, and corporation stop, complete in place. If replacing an existing meter box, cost shall include removal and disposal of the old meter box and assembly. If meter box does not require tying into existing service, pigtail shall be crimped. Cost for either circumstance shall be included in other items bid.

V. Copper Pipe for Water Services (Open Cut):

Measurement: Copper pipe for water services will be measured by the linear foot from the center of the water main to the center of the water meter box in a horizontal plane.

Payment: Copper pipe for water services will be paid for at the contract unit price per linear foot of the size indicated on the drawings and shall include all equipment, labor, and materials for installation, to include testing and disinfection, complete in place, at a minimum depth of 24 inches below the top of the meter box.

W. Copper Pipe for Water Services (by Jacking or Boring):

Measurement: Copper pipe by jacking or boring will be measured by the linear foot from the center of the water main to the center of the water meter box in a horizontal plane.

Payment: Copper pipe by jacking or boring will be paid for at the contract unit price per linear foot of the size indicated on the drawings and shall include all equipment, labor, and materials for installation to include testing and disinfection, complete in place, at a minimum of 24 inches below the top of the meter box.

X. Removal of Asbestos Cement Pipe:

Measurement: Removal of asbestos cement pipe will be measured based on the following definition: when the amount of pipe to be removed is less than 12 feet, the item will be measured on an each basis. When the amount removed exceeds 12 feet, the item will be measured on an each basis plus the bid price per linear foot for pipe removed in excess of 12 feet.

Payment: Removal of asbestos cement pipe will be paid for at the contract unit price per each up to 12 feet of removal then after 12 feet, an additional payment will be made on top of the each basis, per linear foot and shall include all labor, materials, and equipment to excavate, remove and properly disposal of pipe.

Y. Dechlorination: (Not a pay item, incidental to other items bid)**1.4 STORM DRAINAGE****A. Storm Pipe (including Carrier Pipe):**

Measurement: Storm pipe will be measured from the exact beginning of the pipe to the end of the pipe.

Payment: Storm pipe will be paid for at the contract unit price per linear foot for pipe of the type and size specified, complete in place (excluding stone bedding), at the 4-foot minimum depth to top of pipe. This price shall include trench excavation (excluding rock), shoring or use of trench box, installation, pumping, joint compound, backfilling, compaction, and disposal of excess material.

B. Manholes - Standard:

Measurement: Standard manholes will be measured by the vertical foot of manhole constructed. Manholes shall be measured from the lowest point of the invert to the top of the concrete casting and recorded to the nearest ½-foot.

Payment: Standard manholes will be paid for at the contract unit price per vertical foot, complete in place, including excavation. Price shall include complete invert pouring and forming of concrete in accordance with the standards and drawings, rubber boots, bedding stone, bolting castings to cone, gaskets, vent pipe if required, vacuum testing, backfill, and compaction. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

C. Manholes – Drop (Interior and Exterior):

Measurement: Drop manholes will be measured the same as for a standard manhole in vertical feet manhole constructed plus, a separate measurement per vertical foot per drop height as shown on **Standard Details 27.04 and 27.05**. The drop height shall be from invert of the lower line to invert of the upper line.

Payment: Drop manholes will be paid in vertical feet at the contract unit price of regular manhole plus a separate payment per linear foot for drop height (DH) as shown on **Standard Details 27.04 and 27.05** and measured from the invert of lower line to the invert of upper line including pipe, bends, concrete, bedding stone, and excavation. Price is to include strapping to casting (as applicable), concrete, tees, elbows, plugs/caps, stone, backfill and compaction, complete in place. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

D. Manholes – Doghouse:

Measurement: Doghouse manholes will be measured the same as for a standard manhole in vertical feet of manhole constructed. Manholes shall be measured from the lowest point of the invert to the top of the concrete casting and recorded to the nearest ½-foot.

Payment: Doghouse manholes will be paid for at the contract unit price per vertical foot, complete in place, including excavation. Price shall include pouring of concrete footing and invert, invert forming in accordance with the standards and drawings, bedding stone, bolting castings to cone, gaskets, vent pipe if required, vacuum testing, backfill, and compaction. Adjusting rings, frames, covers, and concrete riser rings shall be paid for separately.

E. Manhole Precast Concrete Riser Ring:

Measurement: Manhole precast concrete riser rings, as shown on **Standard Details 25.08 and 27.02**, will be measured from the top of the precast structure to the bottom of the frame, on a vertical foot basis.

Payment: Manhole precast concrete riser rings will be paid for at the contract unit price, complete in place, and shall include all labor, material, and equipment necessary to adjust the height of the manhole frame and cover by inserting a precast concrete riser ring on top of the manhole and sealing the joint with mastic and non-shrink grout.

F. Manhole Frames and Covers – Standard and Waterproof:

Measurement: Manhole frames and covers will be measured on an each basis.

Payment: Manhole frames and covers will be paid for at the contract unit price per each, complete in place, as shown on **Standard Detail 27.10**.

G. Precast Drop Inlets and Bases, VDOT standard:

Measurement: Precast Drop Inlets, VDOT standard, will be measured on an each basis and shall include the following base /manhole heights and inlet lengths based on the particular style of inlet as stated below:

DI-1,	Standard inlet top,	H=2'
DI-2A,	L=2.5',	H=2'
DI-2B,	L=4',	H=2'
DI-2C,	L=6',	H=2'
DI-3A,	L=2.5',	H=2'
DI-3B,	L=4',	H=2'
DI-3C,	L=6',	H=2'
DI-7,	Standard inlet top,	H=2'

Measurement of extra length for inlets will be in linear foot.

Measurement of extra height for the base/manhole will be in vertical foot.

Payment: Precast drop inlets, VDOT standard, will be paid for at the contract unit price per each plus a separate payment for extra inlet lengths and base/manhole heights greater than those defined in the above measurement description. Price shall include all labor, material, and equipment necessary for installation, pouring of concrete invert, invert forming, and mortaring of required components, complete in place.

H. Flared End Section, VDOT Standard:

Measurement: Flared end section, VDOT standard, will be measured on an each basis.

Payment: Flared end section, VDOT standard, will be paid for at the contract unit price per each of the size indicated on the drawings and shall include all equipment, labor, materials for installation, excavation, backfill, sealing and mortaring, complete in place.

I. Endwalls, VDOT Standard:

Measurement: Endwalls, VDOT standard, will be measured on an each basis.

Payment: Endwalls, VDOT standard, will be paid for at the contract unit price per each of the size and type indicated on the drawings and shall include all equipment, labor, materials for installation, excavation, backfill, sealing and mortaring, complete in place.

J. Manhole Abandonment:

Measurement: Manhole abandonment will be measured on an each basis.

Payment: Manhole abandonment will be paid for at the contract unit price per each, complete in place, in accordance with Section 02730, *Sanitary Sewer*.

1.5 EARTHWORK

A. Offsite Borrow:

Measurement: Off-site borrow will be measured in its original position by cross sectioning the area excavated for borrow. The number of cubic yards will be computed from cross section measurements by the average end method. When it is impractical to measure the borrow, and if approved by the City Engineer, vehicular measurements will be made in accordance with *VDOT Road and Bridge Specifications*, Section 109.01.

Payment: Off-site borrow will be paid at the contract unit price per cubic yard for material placed, compacted, and complete in place, including all excavation, loading, hauling, erosion control of borrow source, placement, spreading and compaction of borrow material.

- B. **Onsite Borrow:** Material obtained from the site by cut and fill areas or other areas onsite that are designated to be used as borrow material is not a pay item for material but payment will be made by regular excavation.

C. Regular Excavation:

Measurement: Regular excavation will be measured in its original position by cross sectioning the excavation area. The number of cubic yards will be computed from cross section measurements by the average end method. When it is impractical to measure by cross-section method, other acceptable methods, involving three-dimensional measurements may be used if approved by the City Engineer.

In cut sections, excavation of topsoil and root mat and material down to a point of 1 foot below elevation of the top of earthwork or to the depth specified on the plans will be measured at regular excavation. When areas of unsuitable material are shown on the plans, excavation down to a point of 1 foot below the elevation of such material shown on the plans will be measured as regular excavation.

In fill sections, excavation of topsoil and root mat and material down to an elevation of 1 foot below the bottom of topsoil and root mat will be measured at regular excavation. When areas of unsuitable material are shown on the plans, excavation down to a point 1 foot below the elevations of such material shown on the plans will be measured at regular excavation.

Payment: Regular excavation will be paid at the contract unit price per cubic yard of excavation and shall include all labor, equipment, and material required, complete in place, including all excavation, loading, moving of cut and fill material, placement, spreading and compaction of material.

D. Rock Excavation:

Measurement: Rock excavation will be measured by the City Engineer or his representative in its original position, after which the rock shall be excavated to the depth specified by the City Engineer and then measured by the cubic yard. Rock excavation shall consist of the removal and satisfactory disposal of all materials, which in the opinion of the Engineer, cannot be excavated except by drilling, blasting, "jack hammering or hoe

ramming.” No payment shall be made for rock removal by ripping. It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than one-half cubic yard will be classified as rock.

Payment: Rock excavation will be paid for at the contract unit price per cubic yard for rock excavation and shall include all labor, materials, and equipment to excavate and dispose of rock off site.

E. Undercut Excavation:

Measurement: The material shown on the plans as undercut excavation or determined by the City Engineer to be unsuitable and designated as undercut excavation and not included in regular excavation will be measured by cross sectioning the undercut area. The number of cubic yards will be computed by average end method. When it is impractical to measure by cross-section method because of erratic locations of isolated deposits, other acceptable methods, involving three-dimensional measurements may be used if approved by the City Engineer.

When unsuitable material must be removed from an area of the project where undercut is not shown on the plans, unsuitable material removed after reaching an elevation 1 foot below the top of the earthwork in cut sections and 1 foot below the bottom of topsoil and root mat in fill sections will be measured as undercut excavation. Unsuitable material removed after reaching an elevation 1 foot below the top of earthwork in cut sections, or 1 foot below the elevation of such material shown on the plans, or 1 foot below original ground in fill sections where topsoil and root mat are not required to be removed, will be measured as undercut excavation.

Payment: Undercut excavations will be paid for at the contract unit price per cubic yard for undercut excavation and shall include all labor, equipment, and material required, complete in place, including all excavation and disposal of material.

F. Pavement Cut and Removal:

Measurement: Pavement cut and removal shall consist of the removal and satisfactory disposal of all materials that may be designated for removal by the City Engineer or shown to be removed on plans. Pavement cut and removed shall be measured by the square yard in terms of material removed from its original positions. No payment for materials removed without authorization from the City Engineer or beyond the lines and grades set by the City Engineer.

Payment: Pavement cut and removal will be paid for at the contract unit price per square yard. The price shall include all labor, equipment, and materials necessary to remove and dispose of, off site, any required structures, complete in place, including sawing or cutting the existing pavement if required.

G. Concrete Cut and Removal:

Measurement: Concrete cut and removal shall consist of the removal and satisfactory disposal of all materials in concrete structures that may be designated for removal by the City Engineer or shown to be removed on plans. These structures shall include sidewalks, concrete pavement, and other minor structures; measured by the square yard

in terms of material removed from its original positions. No payment for materials removed without authorization from the City Engineer or beyond the lines and grades set by the City Engineer.

Payment: Concrete cut and removal will be paid for at the contract unit price per square yard. The price shall include all labor, equipment, and materials necessary to remove and dispose of, off site, any required structures, complete in place, including sawing or cutting the existing concrete if required.

H. **Other: Other items shall be paid for as stated in the Proposal.**

1.6 BASE COURSE & PAVING

A. Foundation Stone:

Measurement: Foundation stone for roadways will be measured by the cubic feet of foundation stone placed. Cubic feet of foundation stone material placed will be converted to tons using the weight of 145 pounds per cubic feet.

Payment: Foundation stone, if approved by the City Engineer, will be paid for at the contract unit price for foundation stone by the ton. Price shall include removal and disposal of unusable material and placement of stone, complete in place.

B. Aggregate Base Course:

Measurement: Aggregate base course will be measured in square yards of the thickness as shown on the plans (or in tons, only if approved by the City Engineer). When the ton unit is specified, the quantity shall be determined on scales equipped with a dial and an automatic printer, all of which have been approved and sealed in accordance with Section 109, *VDOT Road and Bridge Specifications*.

Payment: Aggregate base course will be paid at the contract unit price bid for square yards of a specified depth as shown on the plans or unit price bid per ton for Type I, size 21A or 21B aggregate base. Price shall include all material, equipment and labor required to furnish and install the stone, complete in place.

C. Portland Cement Treated Aggregate:

Measurement: Portland cement treated aggregate will be measured in square yards of material with thickness as shown on the plans or as directed by the City Engineer.

Payment: Portland cement treated aggregate will be paid at the contract unit price bid for square yards with thickness as shown on the plans or as directed by the City Engineer. This price shall include all material, equipment and labor required to furnish and install the Portland cement treated aggregate, complete in place.

D. Asphalt Concrete Pavement:

Measurement: Asphalt concrete pavement shall be measured in tons of the type specified as evidenced by plant delivery tickets. For all overlays, field measurements and calculations will be made also for use as a comparison between estimated and actual

tonnage used. If quantity differences are found, without justification, measurement will be based on field measurement basis. Measurement for new roadways will be based on plan quantities and field measurement, not tonnage tickets.

Payment: Asphalt concrete pavement will be paid for at the contract unit price bid per ton for the type of Asphalt concrete specified. This price shall be full compensation for asphalt concrete pavement, complete in place, including all materials, labor, tools, equipment, tack coat, maintenance of traffic and all other incidentals necessary. Adjusting manholes, lampstacks, cleanouts, valve boxes, etc. will be paid separately at the bid price for each when adjusted by the Contractor.

Price Adjustment for Asphalt Material: Bid items which contain asphalt material will be subject to price adjustment by the City as set for herein.

The base price index for liquid asphalt materials will be determined by Virginia Department of Highways & Transportation from a survey of at least six (6) terminals locate in Virginia or adjacent States using the average f.o.b. selling price of the material on the date of receipt of bids. The current price index for liquid asphalt material will be determined from a survey of the same six terminals using the average f.o.b. selling price of the material on the first of each month. In the event the Department is unable to secure price quotes for liquid asphalt material from at least six terminals as a result of causes beyond the Department's control, data from the remaining terminals surveyed will be used in determining the indexes.

The indexes will be final and incontestable. The list of terminals surveyed and the base price index are available from the Department upon request.

The amount of adjustment applied to the unit price bid will be based upon the difference between the Base Price Index and the Current Price Index. The Contractor is hereby advised that adjustments as a result of differences in Current and Base Price Indexes will not be made in unit bid prices, for items designated as price adjustment items, when such difference is less than 10%. In the event the Current Price Index is greater than the Base Price Index, the price for designated liquid asphalt material and for designated bid items which contain asphalt material, placed during that estimate period, will be increased by an equal dollar amount per ton or gallon, as applicable, of liquid asphalt material incorporated in the work. In order to receive payment for an increase in price adjustment, the Contractor shall, on the first of the month prior to the estimate date, submit written certification to the Engineer that he has had an increase in the purchase price in liquid asphalt or asphalt cement for each type used. In the event the Current Price Index is less than the Base Price Index, the price for designated liquid asphalt material and for designated bid items which contain asphalt material, placed during that estimate period, will be decreased by an equal amount per ton or gallon, as applicable, of liquid asphalt material incorporated in the work. Such decrease will not be effected when the Contractor certifies in writing on the first of the month prior to the estimate date that a decrease has not occurred in the purchase price of each type of liquid asphalt or asphalt cement used. The quantity of liquid asphalt concrete mixtures for which adjustment is applicable will be determined from the percent shown on the approved job mix formula in use during the estimate period.

No adjustments will be made for liquid asphalt material used as a prime or tack coat when such material is not shown as a separate pay item in the contract. The quantity of designated liquid asphalt materials(s) for which adjustment is applicable will be determined from the gallons incorporated in the work during the estimate period.

For the purpose of price adjustment under this provision, certain surveyed asphalt materials will be considered as representatives of those items designated for adjustment. The index representation is as follows:

Asphalt Cements are based upon the index for AC-20.

Anionic Emulsions are based upon the index for RS-2.

Cationic Emulsions are based upon the index for the individual average of each type of the cationic emulsions.

Cutbacks are based upon the index for RC-250.

The current price index on the first of the month will be applicable for adjustments of estimates during the month.

When a schedule is completed prior to the conclusion of an estimate period, the most recent index prior to the date of completion will be used for price adjustment.

An apparent attempt to unbalance bids in favor of items subject to price adjustment may result in rejection of the bid proposal.

E. Tack Coat: (Not a pay item, incidental to other items bid)

F. Prime Coat:

Measurement: Liquid asphalt material will be measured by the gallon and cover aggregate by the ton.

Payment: Liquid asphalt material will be paid for at the contract unit price bid per gallon. Cover stone will be paid for at the contract unit price bid per ton. This price shall include all labor, equipment, and materials to furnish, install, and maintenance of the treatment until surface course is applied, complete in place.

G. Seal Coat:

Measurement: Liquid asphalt material will be measured by the gallon and cover aggregate by the ton.

Payment: Liquid asphalt material will be paid for at the contract unit price bid per gallon. Cover stone will be paid for at the contract unit price bid per ton. This price shall include all labor, equipment, and materials to furnish and install, complete in place.

H. Pavement Repair or Street Rehab: This item shall cover pavement repair in areas where it becomes necessary to remove and replace the existing pavement in failed areas or areas where patching is required as part of roadway work or in locations as otherwise requested by the City Engineer. Refer to **Standard Details 25.18, 25.19, 25.20, 25.21, 25.22** for required depths and pavement types.

Measurement: Work and materials for pavement repair will be measured in the following manner.

- 1). **Asphalt pavement and concrete pavement cut and removal for street repair** will be measured in square yards of pavement, temporary maintenance stone, or other material removed.

- 2). **Aggregate base stone for pavement repair** will be measured in square yards.
- 3). **Aggregate base stone for surface treated pavement repair** will be measured in square yards.
- 4). **Asphalt base for pavement repair** will be measured in square yards.
- 5). **Asphalt surface for pavement repair** will be measured in square yards.
- 6). **Surface treatment for surface treated pavement repair** will be measured in square yards.
- 7). **Temporary pavement repair** will be measured in terms of square yards.

Payment: Work and materials for pavement repair will be paid for in the following manner.

- 1). **Asphalt and concrete cut and removal for pavement repair** will be paid for at the contract unit bid price per square yard. This price shall include all labor, equipment, and material to sawcut, excavate, remove and dispose of material, and all work and grading to prepare the surface for paving, complete in place.
- 2). **Aggregate base stone for pavement repair** will be paid for at the contract unit price bid per square yard (at a specified depth as shown on applicable details or as directed by the City Engineer) for Type I aggregate base. This price shall include all labor, equipment, and material necessary to furnish and install the stone, complete in place.
- 3). **Aggregate base stone for surface treated pavement repair** will be paid for at the contract unit price bid per square yard (at a specified depth as shown on applicable details or as directed by the City Engineer) for Type I aggregate base. This price shall include all labor, equipment, and material necessary to furnish and install the stone, complete in place.
- 4). **Asphalt base for pavement repair** will be paid for at the contract unit price bid per square yard (at a specified depth as shown on applicable details or as directed by the City Engineer) for the type of base mix as shown on the plans or as directed by the City Engineer. This price shall include all labor, materials, and equipment, including tack, necessary to furnish and install the asphalt, complete in place.
- 5). **Asphalt surface for pavement repair** will be paid for at the contract unit price bid per square yard at a specified depth as shown on applicable details or as directed by the City Engineer. This price shall include all labor, materials, and equipment, including tack, necessary to furnish and install the asphalt, complete in place.
- 6). **Surface treatment for surface treated pavement repair** will be paid for at the contract unit price bid per square yard for surface treatment for pavement repair. This price shall be full compensation for one prime coat and two seal coats, complete in place.

- 7). **Temporary pavement repair** will be paid for at the contract unit price bid per square yard for temporary pavement repair at a specified depth as shown on applicable details or as directed by the City Engineer.

I. Pavement Profiling:

Measurement: Pavement profiling will be measured in square yards for each 1 inch depth of material profiled and removed.

Payment: Pavement profiling will be paid for at the contract unit price bid per square yards per 1 inch depth and shall include all labor, materials, and equipment necessary to remove and dispose of the material, complete in place.

J. Trench Patching for New Pipe Installation - Permanent and Temporary:

Measurement: Trench patching will be measured in square yards per patch type. Refer to **Standard Details 25.18, 25.19, 25.20, 25.21 and 25.22** for calculation of widths, measurement will be made based on minimum dimensions shown.

Payment: Trench patching will be paid for at the contract unit price bid in square yards per patch type as shown in **Standard Details 25.18, 25.19, 25.20, 25.21 and 25.22**. and shall include all labor, materials, and equipment necessary to install the patch, complete in place. Pavement cut and removed for this item will be paid for separately, see trenching section of these specifications.

K. Emulsified Asphalt Slurry Seal Surfaces:

Measurement: Emulsified asphalt slurry seal will be measured in square yards based on surface measurements.

Payment: Emulsified asphalt slurry seal will be paid for at the contract unit price bid in square yards for the type of seal specified and shall include all labor, equipment, and materials necessary, complete in place.

L. Adjusting Manholes, Lampstacks, and Valves for Resurfacing:

Measurement: Manhole, lampstack, and valve box adjusting will be measured on an each basis for the type of structure adjusted.

Payment: Manhole, lampstack, and valve box adjusting by the method of removing and adjusting the frame and cover as shown on **Standard Detail 25.08** will be paid for at the contract unit price per each for adjusting manholes, lampstacks, and valves, and shall include all labor, equipment, and materials necessary for a complete in place installation.

M. Manhole, Valve Box, and Lampstack Adjusting Rings for Resurfacing:

Measurement: Manhole, valve box, and lampstack adjusting rings, will be measured on an each basis for the type of ring installed.

Payment: Manhole, valve box, and lampstack adjusting rings, as shown on **Standard Detail 25.09**, will be paid on an each basis for the type of ring installed at the contract unit price and shall include all labor, material, and equipment necessary to place

inserting ring in existing frame, complete in place, including countersinking holes and installation of epoxy.

N. Manhole, Valve Box, and Lampstack Replacement for Resurfacing:

Measurement: Manhole, valve box, and lampstack replacement will be measured on an each basis for the type of frame installed.

Payment: Manhole, valve box, and lampstack replacement for resurfacing will be paid on an each basis for the type of frame installed at the contract unit price and shall include all labor, material, and equipment necessary to remove and install a new frame, complete in place. Refer to **Standard Details 27.02, 27.13, and 26.16** for installation.

O. Type 1, Aggregate Stone for Shoulder Restoration after Paving:

Measurement: Shoulder stone for restoration after paving will be measured by the cubic feet as shown on the plans or as directed by the City Engineer. Cubic feet of stone material placed will be converted to tons using the weight of 145 pounds per cubic feet.

Payment: Shoulder stone for restoration after paving will be paid for at the contract unit price by the ton. Price shall include all labor, equipment, and materials necessary for furnishing and placing of stone, complete in place.

P. Maintenance Stone for Pipe Installation:

Measurement: Maintenance stone for pipe installation will be measured by the cubic feet of material placed per the direction of the City Engineer's representative. Cubic feet of material calculated will be converted to tons using the weight of 145 pounds per cubic foot.

Payment: Maintenance stone for pipe installation will be paid for at the contract unit price per ton for aggregate backfill on a one time basis and shall include all materials, equipment, and labor required to furnish and compact, complete in place, VDOT No. 21A stone in the locations designated by the City Engineer.

Q. Asphalt Concrete Curb:

Measurement: Asphalt concrete curb will be measured in by the linear foot.

Payment: Asphalt concrete curb will be paid for at the contract unit price bid in linear foot for the VDOT type MC-3C and shall include all labor, equipment, and materials necessary for a complete in place installation.

R. Asphalt Concrete Paved Flumes, Walks, etc.:

Measurement: Asphalt concrete paved flumes, walks, etc. will be measured in square yards for a depth of 4 inches.

Payment: Asphalt concrete paved flumes, walks, etc. will be paid for at the contract unit price bid in square yards for a depth of 4 inches and shall be installed in accordance with applicable VDOT details and specifications, including all labor, equipment, and materials necessary for a complete in place installation.

S. Pavement Reinforcing Fabric:

Measurement: Pavement Reinforcing Fabric will be measured in square yards.

Payment: Pavement Reinforcing Fabric will be paid for at the contract unit price bid in square yards and shall include all labor, equipment and materials necessary for a complete in place installation.

1.7 CURB & GUTTER, DRIVEWAYS, SIDEWALKS, AND MISCELLANEOUS CONCRETE ITEMS**A. New Concrete Sidewalk, 4 inches thick:**

Measurement: New sidewalk, 4 inches thick will be measured in square yards of finished concrete.

Payment: New sidewalk, 4 inches thick will be paid for at the contract unit price bid per square yard at a depth of 4 inches. This price shall include all labor, equipment, and material for excavation, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation, as shown on **Standard Detail 25.05** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

B. Replacement of Concrete Sidewalk, 4 inches thick:

Measurement: Replacement of sidewalk, 4 inches thick will be measured in square yards of finished concrete.

Payment: Replacement of sidewalk, 4 inches thick will be paid for at the contract unit price bid per square yard at a depth of 4 inches. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing sidewalk, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Detail 25.05** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

C. New Concrete Driveways, Entrances, and Sidewalks, 7 inches thick:

Measurement: New concrete driveways, entrances, and sidewalks, 7 inches thick will be measured in square yards of finished concrete.

Driveways formed in conjunction with standard curb, and curb and gutter, shall be measured in square yards as follows:

- 1) In length from face to face of the curb at the back edge of the driveway.
- 2) In width from the back edge of the driveway to the back edge of the curb extended.

Payment: New concrete driveways, entrances, and sidewalks, 7 inches thick will be paid for at the contract unit price bid per square yard at a depth of 7 inches. This price shall include all labor, equipment, and material for excavation, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place

installation,

as shown on **Standard Details 25.10, 25.11, 25.12** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

D. Replacement of Concrete Driveways, Entrances, and Sidewalks, 7 inches thick:

Measurement: Replacement of concrete driveways, entrances, and sidewalks, 7 inches thick will be measured in square yards of finished concrete.

Driveways formed in conjunction with standard curb, and curb and gutter, shall be measured in square yards as follows:

- 1) In length from face to face of the curb at the back edge of the driveway.
- 2) In width from the back edge of the driveway to the back edge of the curb extended.

Payment: Replacement of concrete driveways, entrances, and sidewalk, 7 inches thick will be paid for at the contract unit price bid per square yard at depth of 7 inches. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Details 25.10, 25.11, 25.12** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

E. New Concrete Curb and Gutter, City Standard, Combined 6":

Measurement: New concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: New concrete curb and gutter, City standard will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

F. Replacement of Concrete Curb and Gutter, City Standard, Combined 6":

Measurement: Replacement of concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: Replacement of concrete curb and gutter will be paid for at the contract unit price bid per linear foot. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

G. New Concrete Curb and Gutter, City Standard, Combined 4":

Measurement: New concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: New concrete curb and gutter, City standard will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

H. Replacement of Concrete Curb and Gutter, City Standard, Combined 4":

Measurement: Replacement of concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: Replacement of concrete curb and gutter will be paid for at the contract unit price bid per linear foot. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

I. New Concrete Curb and Gutter, VDOT Standard – CG -6:

Measurement: New concrete curb and gutter, VDOT standard, CG-6 will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: New concrete curb and gutter, VDOT standard, CG-6 will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

J. Replacement of Concrete Curb and Gutter, VDOT Standard - CG-6:

Measurement: Replacement of concrete curb and gutter, VDOT Standard - CG-6 will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: Replacement of concrete curb and gutter will be paid for at the contract unit price bid per linear foot. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

K. New Concrete Curb and Gutter, VDOT Standard – CG -7:

Measurement: New concrete curb and gutter, VDOT standard, CG-7 will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: New concrete curb and gutter, VDOT standard, CG-7 will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

L. Replacement of Concrete Curb and Gutter, VDOT Standard - CG-7:

Measurement: Replacement of concrete curb and gutter, VDOT Standard - CG-7 will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: Replacement of concrete curb and gutter will be paid for at the contract unit price bid per linear foot. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

M. New Concrete Curb, VDOT Standard - CG-2:

Measurement: VDOT standard concrete curb, CG-2 will be measured in linear feet along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways.

Payment: VDOT standard concrete curb, CG-2 will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **VDOT Road and Bridge Standards, Detail CG-2** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

N. New Concrete Curb and Gutter, City Standard, Combined Rolltop:

Measurement: New concrete curb and gutter, City standard, Combined Rolltop, will be measured per linear foot along the face of the curb for the entire length of the work.

Payment: New concrete curb and gutter, City standard, Combined Rolltop, will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.04** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

O. Facedown Concrete Curb/Sidewalk:

Measurement: Facedown concrete curb will be measured in linear feet along the face of the curb including handicap ramps but excluding driveway openings. Facedown curb is not a pay item through a driveway opening. The sidewalk portion of this line item will be measured in square yards for 4 inches thick sidewalk.

Payment: Facedown concrete curb will be paid in linear foot the contract unit price for 6"X12" face down curb. The sidewalk portion of this item will be paid for as 4 inches thick sidewalk. Both line item prices shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **Standard Detail 25.06** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

P. Concrete Handicap Ramp:

Measurement: Concrete handicap ramps will be measured in square yards of finished concrete with a thickness of 4 inches.

Payment: Concrete handicap ramps will be paid for at the contract unit price bid per square yard at a depth of 4 inches. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, detectable warning surface, curing, etc. for a complete in place installation as shown on **Standard Details 25.10, 25.13, 25.15, 25.16, and 25.17** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

Q. Formed Concrete for Retaining Walls, Headwalls, Piers, Steps, and other misc. Concrete Structures:

Measurement: Formed concrete for retaining walls, headwalls, piers, steps, and other misc. concrete structures will be measured by the cubic yard and class as specified on the drawings or applicable details.

Payment: Formed concrete for retaining walls, headwalls, piers, steps, and other misc. concrete structures will be paid for at the contract unit price bid per cubic yard for concrete, complete in place. Weep holes, water stops, etc. will be included in the price of concrete for retaining walls. All backfilling will be included in bid price for concrete. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details.

The only additional pay items for retaining walls will be:

1. Excavation -will be measured and paid for in cubic yards at the unit price bid for regular excavation.
2. Porous backfill material – will be measured and paid for in tons as coarse granular aggregate backfill.
3. Rebar – will be measured and paid for in pounds as Reinforcing steel bars.

No payment will be made for excavation or any other structures. The only additional pay item for other structures will be reinforcing steel bars.

R. Unformed Concrete for Footings, Collars, etc. (Poured without Forms):

Measurement: Unformed Concrete for footings, collars, etc. will be measured by the cubic yard and class as specified on the drawings or applicable details.

Payment: Unformed Concrete for footings, collars, etc. will be paid for at the contract unit price per cubic yard and class for unformed concrete for footings, collars, etc. and shall include all labor, equipment, and material to place the concrete for a specific item, complete in place. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details.

S. Reinforcing Steel Bars:

Measurement: Reinforcing steel will be measured in pounds of reinforcing by the quantities as shown on the drawings or applicable details.

Payment: Reinforcing steel bars will be paid for at the contract unit price bid per pound and shall include all labor, equipment, and materials to install the bars, complete in place. Payment will be made only for the quantities and dimensions as shown on the drawings or applicable details.

T. Reinforcing Steel Wire Mesh:

Measurement: Reinforcing steel wire mesh will be measured in square yards of 6x6, 10 GA material placed.

Payment: Reinforcing steel wire mesh will be paid for at the contract unit price per square yards of 6x6, 10 GA. and shall include all labor, equipment, and materials to install the wire mesh as shown on the drawings or applicable details, complete in place.

U. Concrete Paved Ditches, VDOT PG-2A, PG-4, PG-5:

Measurement: Concrete paved ditches, VDOT PG-2A, PG-4, PG-5 will be measured per square yard of paved ditch based on measurements as defined on applicable details.

Payment: Concrete paved ditches, VDOT PG-2A, PG-4, PG-5 will be paid for at the contract unit price per square yard and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the **VDOT Details, PG-2A, PG-4, PG-5** and installed at the locations as shown on the construction drawings and/or as directed by the City Engineer.

V. VDOT Handrail, HR-1:

Measurement: VDOT handrail, HR-1 will be measured in linear foot.

Payment: VDOT handrail, HR-1 will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and materials to install the handrail as shown on the **VDOT Detail HR-1**, complete in place.

W. Tree Well in Sidewalk:

Measurement: Tree wells will be measured on an each basis.

Payment: Tree wells will be paid for at the contract unit price per each and shall include all labor, equipment, and materials to install the tree well as shown on the **Standard Detail 25.07**, complete in place.

X. Concrete Parking Blocks:

Measurement: Concrete parking blocks will be measured on an each basis.

Payment: Concrete parking blocks will be paid for at the contract unit price per each and shall include all labor, equipment, and materials to install the parking block, complete in place.

1.8 ITEMS MISCELLANEOUS TO ALL SECTIONS

A. Clearing and Grubbing, Lightly Wooded Areas:

Measurement: Clearing and grubbing, lightly wooded areas will be measured by the acre. Width shall not exceed width as defined in the disturbing and construction limits criteria of sewer, water, and storm construction. Lightly wooded areas shall be defined as areas where the prevalent vegetation consists of trees less than 12 inches in diameter.

Payment: Clearing and grubbing, lightly wooded areas will be paid for at the contract unit price per acre and shall include all material, equipment, and labor required to clear and grub lightly wooded areas in accordance with these specifications. The price shall also include the removal and disposal of items that cannot be mulched or built into brush piles.

B. Clearing and Grubbing, Heavily Wooded Areas:

Measurement: Clearing and grubbing, heavily wooded areas will be measured by the acre. Width shall not exceed width as defined in the disturbing and construction limits criteria of sewer, water, and storm construction. Heavily wooded areas shall be defined as areas where the prevalent vegetation consists of trees 12 inches or greater in diameter.

Payment: Clearing and grubbing, heavily wooded areas will be paid for at the contract unit price per acre and shall include all material, equipment, and labor required to clear and grub heavily wooded areas in accordance with these specifications. The price shall also include the removal and disposal of items that cannot be mulched or built into brush piles.

C. Temporary Access or Haul Roads:

Measurement: Any grading or excavation required for equipment travel during the course of construction as well as erosion control, removal, restoration, seeding and ground cover, shall be included in other items bid.

Payment: Included in other items bid. Not a pay item.

D. Flowable Fill Concrete:

Measurement: Flowable fill will be measured by the cubic yard of concrete placed.

Payment: Flowable fill will be paid for at the contract unit price, complete in place, and shall include all materials, labor and equipment to place the concrete in locations as directed by the City Engineer or designated on the plans. This price shall also include any excavation and blocking or forming required.

E. Miscellaneous Unformed Concrete:

Measurement: Miscellaneous Unformed Concrete will be measured by the cubic yard and class as specified on the drawings.

Payment: Miscellaneous Unformed Concrete will be paid for at the contract unit price per cubic yard for unformed concrete for reaction anchor blocks, collars, footings, and so forth complete and in place, including all material, equipment, and labor, to place the concrete in the locations shown on the construction drawings and/or as directed by the City Engineer. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details.

F. Miscellaneous Formed Concrete:

Measurement: Miscellaneous Formed Concrete will be measured by the cubic yard and class as specified on the drawings.

Payment: Miscellaneous Formed Concrete will be paid for at the contract unit price per cubic yard for formed concrete placed that is designated to be paid for as "formed concrete", complete and in place, including all material, equipment, and labor, to place the concrete in the locations shown on the construction drawings and/or as directed by the City Engineer. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details.

G. Seeding and Fine Grading:

Measurement: Seeding and fine grading will be measured in square yards of area seeded. Seeding and fine grading shall be provided as described section in *General Requirements*, Section 01000. Extra compensation will not be made for additional seeding beyond all limits of construction as defined in applicable section.

Payment: Seeding and fine grading will be paid for at the contract unit price per square yard for seeding and fine grading as described in *General Requirements*, Section 01000. No compensation will be made for reseeding, if required.

H. Seeding and Grading, (Pasture and Wooded Areas):

Measurement: Seeding and grading pasture and wooded areas will be measured in square yards of area seeded. Seeding and fine grading shall be provided as described section in *General Requirements*, Section 01000. Extra compensation will not be made for additional seeding beyond all limits of construction as defined in applicable section.

Payment: Seeding and grading will be paid at the contract unit price per square yard for seeding and fine grading as described in *General Requirements*, Section 01000. No compensation will be made for reseeding, if required.

I. VDOT EC-2:

Measurement: VDOT EC-2 will be measured by the square yard.

Payment: VDOT EC-2 will be paid for at the contract unit price per square yard and shall include all material, labor, and equipment necessary for a complete in place installation.

J. Dry Riprap:

Measurement: Dry Riprap will be measured by the ton.

Payment: Dry Riprap will be paid for at the contract unit price per ton of the size as indicated on the drawings and shall include all materials (including geotextile fabric), labor, and equipment necessary for a complete in place installation.

K. Grouted Riprap:

Measurement: Grouted Riprap will be measured by the ton.

Payment: Grouted Riprap will be paid for at the contract unit price per ton of the size as indicated on the drawings, with the top 6 inches grouted and shall include all materials (including geotextile fabric), labor, and equipment necessary for a complete in place installation.

L. Construction Entrance for Erosion Control, (VDOT #1 stone):

Measurement: Construction entrance for erosion control will be measured by the ton of VDOT #1 stone. Calculation shall be based on the length X width X depth of the entrance, as specified in the Erosion & Sediment Control Handbook, and converted to tons.

Payment: Construction entrance for erosion control will be paid for at the contract unit price per ton and shall include all materials (including geotextile fabric), labor, and equipment necessary for a complete in place installation. Payment will be made on a one time basis. No additional payment will be made for maintaining stone.

M. Silt Fence Barrier:

Measurement: Silt fence barrier for erosion control will be measured by the linear foot.

Payment: Silt fence barrier for erosion control will be paid for at the contract unit price per linear foot and shall include all material, labor, and equipment necessary for a complete in place installation. The price shall also include the removal and disposal of silt fence upon stabilization of ground cover.

N. Straw Bale Barrier:

Measurement: Straw bale barrier for erosion control will be measured by the linear foot.

Payment: Straw bale barrier for erosion control will be paid for at the contract unit price per linear foot and shall include all material, labor, and equipment necessary for a complete in place installation. The price shall also include the removal and disposal of straw bales upon stabilization of ground cover.

O. Drop Inlet Silt Trap:

Measurement: Drop inlet silt trap for erosion control will be measured on an each basis.

Payment: Drop inlet silt trap for erosion control will be paid for at the contract unit price per each and shall include all material, labor, and equipment necessary for a complete in place installation. The price shall also include the removal and disposal of the trap upon stabilization of ground cover.

P. Traffic Control:

Measurement: Type III Barricades, Lighted Barrels, and Type II Barricades will be measured on an each basis per day. Pilot Trucks will be measured on an hourly basis.

Payment: Type III Barricades, Lighted Barrels, Type II Barricades and Pilot Trucks will be paid for at the contract unit price as determined by the approved traffic control plan and shall include all material, labor, and equipment necessary for a complete installation. The price shall also include removal of these items. All other traffic control items, devices and measures including flagmen are not a pay item and shall be considered incidental to other bid items.

1.9 GUARDRAIL

Measurement and Payment for Guardrail and appurtenances shall be in accordance with Section 505.04 of VDOT, *Road and Bridge Specifications*, 2002 or latest revision.

END OF SECTION 01200

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02200 - EARTHWORK

(Revised 10/25/04)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

[Part 1 – General](#)
[Part 2 – Products](#)
[Part 3 – Execution](#)

[Clearing and Grubbing](#)
[Compaction – Min Requirements](#)
[Earthwork Volume Measurement](#)

[Subgrade Preparation](#)
[Testing Frequency](#)

PART 1 – GENERAL

The Contractor shall furnish all labor, materials, and equipment to perform all work for all site clearing, site excavation, grading and embankment, excavation and filling and backfilling for structures. Complete all as shown on the contract drawings and in accordance with these Specifications and completely coordinated with all other trades.

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Requirements and Supplementary Conditions applicable to this specification.
- B. Section 01000 – General Requirements.
- C. [Section 02220](#) – Trenching, Backfilling, and Compaction of Utilities.
- D. [Section 02660](#) – Water Distribution.
- E. [Section 02730](#) – Sanitary Sewer.

1.2 SUMMARY

- A. This section includes:
 - 1) Site clearing and grubbing.
 - 2) Stripping and stockpiling topsoil.
 - 3) Excavation and embankment placement.
 - 4) Preparing subgrades for pavements, walks, curb & gutter, and turfed areas.
- B. Construction and materials related to this section but specified in other sections:
 - 1) Landscaping, Seeding, and Groundcover: Section 01000 - *General Requirements*.
 - 2) Erosion Control: See Section 01000 - *General Requirements*.

1.3 DEFINITIONS

For the purposes of this specification, the following definitions refer to earthwork that come under the authority of the City of Lynchburg, Virginia as specified within this section and other sections of this manual.

- A. **Borrow:** Borrow excavation shall consist of approved select fill material imported from off-site.
- B. **Clearing:** Clearing shall consist in the felling, cutting up, and satisfactory disposal of trees and other vegetation designated for removal in accordance with these specifications.
- C. **Fill (in terms of volume):** In terms of volume, fill is defined as a compacted post-construction volume in-place.
- D. **Grubbing:** Grubbing shall consist of the removal of roots 1 ½ inch and larger, organic matter and debris, and stumps having a diameter of three inches or larger, to a depth of at least 18 inches below the surface and or subgrade; which ever is lower, and the disposal thereof.
- E. **Regular Excavation:** Removal and disposal of any and all material above subgrade elevation, except solid rock and undercut excavation, located within the limits of construction.
- F. **Rock Excavation:** Removal and satisfactory disposal of all unsuitable materials, which, in the opinion of the City Engineer, cannot be excavated except by drilling, blasting, wedging, jack hammering or hoe ramming. It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than ½ cubic yard and/or solid ledges, bedded deposits, unstratified masses and conglomerations of material so firmly cemented as to possess the characteristics of solid rock which cannot be removed without systematic drilling, blasting, or hoe ramming will be classified as rock.
- G. **Select Fill Material:** Nonplastic material obtained from roadway cuts, borrow areas, or commercial sources used as foundation for subbase, shoulder surfacing, fill, backfill, or other specific purposes.
- H. **Structures:** Incidental buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. **Subgrade:** Surface or elevation remaining after completing the excavation, or top surface of a fill or backfill immediately below subbase or topsoil materials, as applicable.
- J. **Topsoil:** Topsoil shall consist of friable clay loam, free from roots, stones, and other undesirable material and shall be capable of supporting a good growth of grass.

- K. **Undercut Excavation:** Undercut excavation shall consist of the removal and satisfactory disposal of all unsuitable material located below subgrade elevation. Where excavation to the finished grade section results in a subgrade or slopes of muck, peat, matted roots, etc., the Contractor shall remove such material below the grade shown on the plans or as directed; and areas so excavated shall be backfilled with approved select borrow as ordered by the City Engineer.

1.4 SUBMITTALS

- A. Submit product data and a sample of separation fabric and fully document each with specific location or stationing information, date and other pertinent information.
- B. **Product Data**
- 1) Stabilization/Separation fabric
- C. **Material Test Reports:** Provide from a qualified testing agency test results and interpretation for compliance of the following requirements indicated:
- 1) Classification according ASTM D2487 of each on-site or borrow soil proposed for backfill, unless otherwise directed by the City Engineer.
- 2) Laboratory compaction curve according to ASTM D698 for each on-site or borrow soil material proposed for fill or backfill.
- 3) Laboratory compaction curve according to ASTM D1557 for each on-site borrow soil material proposed for fill and backfill.
- D. **Blasting:** See Section 01000 – *General Requirements*.

1.5 QUALITY ASSURANCE

- A. **Geotechnical Testing Agency Qualifications:** An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing as documented according to ASTM D 3740 and ASTM E 548.
- B. Comply with all codes, laws, ordinances, and regulations of governmental authorities having jurisdiction over this part of the work.
- C. The Contractor shall comply with the latest revision of the Virginia Occupational Safety and Health Standards for the Construction Industry as adopted by the Safety and Health Codes Commission of Virginia.
- D. The Contractor shall comply with Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, "Virginia Erosion and Sedimentation Control Handbook," latest revision.

- E. Comply with applicable requirements of NFPA 495, *"Explosive Materials Code."*
- F. Materials and operations shall comply with the latest revision of the Codes and Standards listed below:

American Society for Testing and Materials

ASTM C 33	Concrete Aggregates
ASTM C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates Sieve Analysis of Fine and Coarse Aggregate
ASTM D 422	Standard Test Method for Particle-Size Analysis of Soils (for classification purposes only)
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³) (Standard Proctor)
ASTM D 1556	Standard Method of Test for Density of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (Modified Proctor)
ASTM D1883	Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
ASTM D 2049	Standard Method of Test for Relative Density of Cohesionless Soils
ASTM D2167	Standard Method of Test for Density of Soil in Place by the Rubber-Balloon Method
ASTM D 2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D 4254	Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

American Association of State Highway & Transportation Officials

AASHTO T 99	The Moisture-Density Relations of Soils using a 5.5-pound hammer and a 12-inch drop
AASHTO T 180	The Moisture Density Relations of Soils using a 10-pound hammer and an 18-inch drop
AASHTO M 145	The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes

1.6 STANDARD ABBREVIATIONS

ANSI	American National Standards Institute
AREA	American Railway Engineers Association
DCR	Virginia Department of Conservation and Recreation
MSDS	Material Safety Data Sheets
OHSA	Occupational Safety and Health Administration
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation

1.7 TESTING SERVICES

- A. The Testing Laboratory shall be approved by the City Engineer and will be responsible for conducting and interpreting tests. The Testing Laboratory shall state in each report whether or not the test specimens conform to all requirements of the Contract Documents and specifically note any deviation.
- B. Specific test and inspection requirements shall be as specified herein.

1.8 PROJECT CONDITIONS

- A. **Demolition:** Demolish and completely remove from the site existing utilities, structures or surface features indicated on the plans to be removed. Coordinate with applicable utility companies to shut off services if lines are active.
- B. **Environmental:** Before crossing or entering into any jurisdictional wetlands, Contractor shall verify whether or not a wetlands permit has been obtained for the encroachment and whether special restrictions have been imposed. Care shall be taken to prevent draining or otherwise destroying non-permitted wetlands. Restore as stated on either the project drawings, the contract documents, and/or as noted in the permit.

C. Geotechnical Investigation

- 1) Where a Geotechnical report has been provided to the Contractor, the data on sub-surface soil conditions is not intended as a representation or warranty of the continuity of such conditions between borings or indicated sampling locations. It shall be expressly understood that the City of Lynchburg will not be responsible for any interpretations or conclusions drawn there from by the Contractor. Data is made available for the convenience of the Contractor.
- 2) In addition to any report that may be made available to the Contractor, the Contractor is responsible for performing any other soil investigations he/they feel(s) is necessary for proper evaluation of the site for the purposes of planning and/or bidding the project, at no additional cost to the City of Lynchburg.

1.9 COORDINATION

- A. At the direction of the City Engineer, temporary bypass pumping of sewerage flow may be required to be provided. See Section 02730 – *Sanitary Sewer* for bypass pumping requirements and procedures.
- B. Refer to Section 02660 – *Water Distribution* for valve operation requirements.
- C. Coordinate tie-ins to municipal system with the City of Lynchburg.
- D. When traffic signals or their appurtenances are likely to be damaged or interfered with as a result of the construction, coordinate temporary operation with the City of Lynchburg Traffic Engineer. Provide a minimum of 48 hours notice prior to anticipated disturbance or interruption.
- E. **Benchmark/Monument Protection:** Protect and maintain benchmarks, monuments or other established reference points and property corners. If disturbed or destroyed, replace at own expense to full satisfaction of Owner/City of Lynchburg.

PART 2 – PRODUCTS

2.1 SOIL MATERIALS

Provide borrow material when sufficient satisfactory soil material is not available from excavations.

2.1.1 MATERIAL CLASSIFICATION

- A. **Excavation:** All excavation material shall be classified as either Regular, Rock, or Undercut Excavation.
- B. **Off-site Borrow:** Off-site borrow shall be select fill material approved by the City Engineer from an off-site borrow source. See [paragraph 1.3](#) of this specification for the definition of select fill material.

- C. **Riprap and Riprap Bedding:** See the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, **Virginia Erosion and Sedimentation Control Handbook**, latest edition.
- D. **Topsoil:** Topsoil meeting the definition prescribed in [paragraph 1.3](#) obtained either from on-site or an off-site source.

2.1.2 SOIL CLASSIFICATION

- A. **Satisfactory Soils:** Non-plastic soils as defined by ASTM D 2487 soil classification group (Unified Classification System) (such as SW, SM, and SC); free of rock or gravel larger than 3 inches in any dimension, debris, organic matter, waste, frozen materials, muck, roots, vegetation, and other deleterious matter.
- B. **Unsatisfactory soils:** Plastic soils as defined by ASTM D 2487 soil classification group (such as ML, CL CH, MH, OH, OL and PT); soils which contain rock or gravel larger than 3 inches in any dimension, debris, organic matter, waste frozen materials, vegetation, and other deleterious matter. Unsatisfactory soils also include satisfactory soils not maintained within 20-percent of optimum moisture content at time of compaction, unless otherwise approved by either the City Engineer or a Geotechnical Engineer.

2.2 MISCELLANEOUS

Geotextile Fabric: See the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, **Virginia Erosion and Sedimentation Control Handbook**, latest edition.

PART 3 – EXECUTION

3.1 GENERAL

3.1.1 GENERAL REQUIREMENTS APPLYING TO ALL AREAS

- A. Contractor shall plan construction to minimize disturbance to properties adjacent to the project site and be within the construction limits shown on the plans.
- B. The City Engineer reserves the right to limit the width of land to be disturbed and to designate on the drawings or in the field certain areas or items within this width to be protected from damage.
- C. Any grading or excavation required for equipment travel during the course of construction as well as erosion control, access or haul road installation and removal, restoration, seeding and ground cover shall be provided by the Contractor.
- D. The Contractor shall be responsible for damage to areas or items designated by the City Engineer to be protected. Repairs to, replacement of, or reparations for areas or items damaged shall be made at the Contractor's expense and to the satisfaction of the City Engineer before acceptance of the completed project.

- E. Any fences disturbed by the Contractor shall be repaired to a condition equal to or better than their original condition or to the satisfaction of the City Engineer at no additional cost.
- F. Contractor shall obtain written permission from property owners for use of any access other than ones located within rights-of-way. Written permission shall contain conditions for use and restoration agreements between property owner and Contractor. No additional compensation will be made for such access.
- G. All areas disturbed shall be restored to a condition equal to or better than their original condition and shall be graded to drain.
- H. The Contractor shall replace or repair all damaged or destroyed hedgerows and property corners. Protection of existing and restoration of damaged or destroyed property corners shall be in accordance with the requirements of Section 01000 – *General Requirements* – Construction Staking.

3.1.2 PROTECTION OF EXISTING UTILITIES

- A. Contractor is responsible for protection of existing utilities in accordance with Section 01000 – *General Requirements*.
- B. Should it become necessary to move the position of any underground structure, the Contractor may be required to do such work and shall be paid on a force account basis or on an extra work basis. Method of payment shall be agreed upon by the City Engineer and the Contractor prior to commencing work.
- C. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the City Engineer and secure instructions. Do not proceed with permanent relocation of utilities until instructions are received from the City Engineer.

3.2 CLEARING AND GRUBBING

- A. This work shall consist of clearing, grubbing, removing, and disposing of all vegetation and debris within the limits of construction, as designated on the plans or as required by the City Engineer. The Contractor shall remove only those trees and shrubs absolutely necessary to allow for the construction. The work shall also include the preservation from injury or defacement of all vegetation or objects designated to remain.
- B. The area within the limits of construction or as designated shall be cleared and grubbed of all trees, stumps, roots, brush, undergrowth, hedges, heavy growth of grasses or weeds, debris and rubbish of any nature which, in the opinion of the City Engineer, is unsuitable for foundation material. Nonperishable items that will be a minimum of five feet below the finish elevation of the earthwork or slope of the embankment may be left in place.

- C. The Contractor shall provide barricades, fences, coverings, or other types of protection necessary to prevent damage to existing improvements, not indicated to be removed, and improvements on adjoining property. All improvements damaged by this work shall be restored to their original condition or to a condition acceptable to the owner or other parties or authorities having jurisdiction.
- D. **Protection of Trees and Vegetation:** Contractor shall protect existing trees and other vegetation indicated by the City Engineer to remain in place against cutting, breaking, or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fences or barricades as required to protect trees and vegetation to be left standing at no additional cost.

Trees and shrubs that are to remain within the construction limits will be indicated on the drawings or conspicuously marked on site. Unless otherwise noted, trees within the construction limits shall become the property of the Contractor and shall be removed from the site.

Carefully and cleanly cut roots and branches of trees indicated to remain where the roots and branches obstruct construction of the utility line. The Contractor shall provide protection for roots and branches over 1 ½ inches diameter that are cut during construction operations. Temporarily cover all exposed roots with wet burlap to prevent roots from drying out. Provide earth cover as soon as possible.

Damaged trees and vegetation designated to remain shall be repaired or replaced at Contractor's expense in a manner acceptable to the City Engineer if they are damaged by construction operations. Repair tree damage as directed by a qualified tree surgeon.

- E. All brush, tree tops, stumps, and debris shall be hauled away and disposed of in accordance with all applicable laws and regulations. The contractor shall clean up debris resulting from clearing operations continuously with the progress of the work and remove promptly all salvageable material that becomes his property and is not to be reused in construction. Sale of material on the site is prohibited. Debris from the site shall be removed in such a manner as to prevent spillage. Keep pavement and area adjacent to site clean and free from mud, dirt, dust, and debris at all times.
- F. The method of stripping, clearing and grubbing the site shall be at the discretion of the Contractor. However, all stumps, roots and other debris protruding through the ground surface or in excavated areas shall be completely removed to a minimum depth of 18 inches below surface and/or subgrade whichever is lower and disposed of off the site by the Contractor, at his expense.
- G. **Marginal Areas:** In marginal areas, with the City Engineer's permission, remove trees where the following conditions exist.

- 1) **Root Cutting:** When clearing up to the "clearing limits," the Contractor shall also remove any tree which is deemed marginal such that when the roots are cut and the tree could be rendered unstable by the affects of high winds and in danger of toppling into either the right-of-way or onto private property.
 - 2) **Slender Bending Trees:** Where young, tall, thin trees are left unsupported by the clearing operation, and are likely to bend over into the right-of-way, the Contractor, during the clearing operation, shall selectively remove those trees which are located outside and adjacent to the clearing limits and City right-of-way or easement as well. During the course of construction and during the one-year warranty period, the Contractor shall remove such young trees that overhang into the right-of-way or cleared area.
- H. Remove the existing topsoil to a depth of 6 inches or to the depth encountered from all areas in which excavation will occur. The topsoil shall be stored in stockpiles, separate from the excavated material, if the topsoil is to be respread. Otherwise material shall be disposed of off-site at the Contractor's expense.

3.3 REGULAR EXCAVATION, UNDERCUTTING, BORROW, EMBANKMENT:

3.3.1 DESCRIPTION

Prior to beginning grading or embankment operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with these specifications.

Should the Contractor, through negligence or other fault, excavate below the designated grades, he shall replace the excavation with approved satisfactory materials, in an approved method, at his own expense. All material determined unsatisfactory shall be disposed of in waste areas as directed. Topsoil shall not be used in embankments but shall be handled and placed as directed.

The Contractor shall satisfy himself as to the character, quantity, and distribution of all materials to be excavated. No payment will be made for any excavated material that is used for purposes other than those designated.

3.3.2 CONSTRUCTION METHODS

- A. **Excavation:** Excavation shall be performed as indicated on the plans or as directed by the City Engineer to the lines, grades, and elevations, and shall be finished to a reasonable smooth and uniform surface. During the process of excavation, the grade shall be maintained and surface shall be rolled so that it will be well drained at all times.

When solid rock is incurred in the excavation, the rock shall be removed to a minimum depth of 12 inches below the surface of the subgrade. Material unsatisfactory for subgrade foundation shall be removed to a depth specified to provide a satisfactory foundation. The portion so excavated shall be refilled with suitable material obtained from the grading operations or borrow area and thoroughly compacted by rolling. Material obtained from on site grading operation must be approved by the City Engineer. For areas that do not require fill, scarify and compact to a depth of 6 inches.

Any removal, manipulation, aeration, replacement, and recompaction of suitable materials necessary to obtain the required density shall be considered as incidental to the construction operations, and shall be performed by the Contractor at no additional cost to the City.

No rock, stone, or rock fragments, larger than 3 inches in their greatest dimension will be permitted in the top 12 inches of the subgrade. No rock, stone, or rock fragments larger than 8 inches in their greatest dimension will be permitted in the remainder of the fill.

- B. **Stabilization of Soft Subgrade with Geotextile:** The use of Geotextile material for subgrade stabilization shall be approved by the City Engineer and shall meet all applicable VDOT standards and specifications.
- C. **Borrow:** Borrow shall not be used until all suitable, on-site, excavated material has been placed in the embankment, unless authorized by the City Engineer. Unless otherwise designated on the plans and contract documents, the Contractor shall make his own arrangements for obtaining select fill material for borrow and pay all costs involved. If the Contractor places more borrow than is required, and thereby causes a waste of excavation, the amount of such waste, unless authorized, will not be included for payment.

D. Embankments

- 1) **Evaluation of Subgrade:** Prior to placement of compacted fill, the City Engineer or his representative shall carefully inspect the exposed subgrade. The Contractor shall then proof roll the exposed subgrade, in the presence of the City Engineer or his representative. The inspection shall include, but not be limited to, proofrolling the prepared subgrade with a rubber-tired fully loaded dump truck that has a minimum gross weight of at least 20,000 pounds (10 tons). No other method will be acceptable. Any unsatisfactory materials thus exposed shall be removed and replaced with satisfactory select material as approved by the City Engineer. Provide the necessary amount of select fill compacted to the density requirements outlined in this specification.
- 2) **Preparation of Ground Surface for Embankments or Fills:** Before fill is placed, scarify existing grade to a minimum depth of 6 inches. In areas where the existing or proposed ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with the existing surface.
- 3) Embankments shall be made of satisfactory soil material and shall be built in successive horizontal layers of not more than 8 inches in loose depth for the full width of the cross sections.

The material entering the embankment in each of the layers shall be within a tolerance of plus or minus 20% of the optimum moisture content before rolling to obtain the prescribed density. Wetting or drying of the material and manipulation when necessary to secure uniform moisture content throughout the layer shall be required. Should the material be too wet to permit proper compaction or rolling, all work on the embankment shall be delayed until such time as the material has dried to the required moisture content. If high moisture is due to negligence of contractor due to improper drainage, the City Engineer may require removal and replacement of material.

Fill material shall not be placed on frozen ground or areas covered with ice and/or snow or areas with a moisture content above optimum.

E. Preparation of areas to receive asphalt pavement or concrete

- 1) **Areas to be Paved:** After all excavation, undercutting, and backfilling has been completed, the subgrade shall be properly shaped and thoroughly compacted. The compactive effort shall include all areas beneath pavement and shall extend at least a minimum of 1 foot behind the paving limits. Compaction shall be in accordance with Table 02200-1.
- 2) **Curb and Gutter, Sidewalks and Driveway Aprons:** The subgrade shall be constructed true to grade and cross section as may be shown on the drawings. Compaction shall be in accordance with Table 02200-1.

All subgrade shall be graded and protected as to prevent an accumulation or standing water, and consequent subgrade saturation, in the event of rain.

F. Grading Tolerances of Finished Surface: Earthwork shall conform to the lines, grades, and typical cross sections shown on the plans or as established by the City Engineer. Changes in grade shall be accomplished by smooth curves.

- 1) Shape subgrade under pavement and curb and gutter to within ½ inch of required subgrade elevations.
- 2) Finish pavement and curb and gutter to within ½ inch of required finish elevations.
- 3) Shape subgrade under sidewalks to within 0.10 foot of required subgrade elevations.
- 4) Finish sidewalks to within 0.10 foot of required finish elevations.
- 5) For all other areas, subgrade and finish elevations shall be within 0.10 foot of required corresponding elevations.

G. Backfill of Curb and Gutter and Sidewalks: Immediately after the removal of forms for curb and gutter, sidewalks and driveways, the space between the back of the curb, sidewalks, and driveways shall be backfilled and smoothed off in a manner to prevent the accumulation of standing water.

3.4 SUBGRADE COMPACTION TESTING AND CONTROL

- A. **Municipal Projects:** For municipal projects, the City may employ and compensate a Geotechnical testing firm to provide soils testing and inspection services.
- B. **Private Projects:** For private development projects which involves proposed City-owned infrastructure the developer, at the discretion of the City Engineer, may be required to employ a Geotechnical testing firm to perform the testing and provide copies of the tests reports to the City for approval and record.
- C. **All Projects**

1) Minimum Compaction Testing Frequency

Location	Frequency
Buildings and structures	1 test group ^a for every 5,000 square feet
Road	1 test group ^a for every 300 feet of road
Parking Lots	1 test group ^a for every 10,000 square feet
Unpaved areas	1 test group ^a for every 20,000 square feet
Pipe Trench	1 test group for every 300 feet

^a One test group consists of compaction tests on each layer of fill and backfill material.

- 2) In the absence of a pre-construction Geotechnical investigation, the Geotechnical testing firm is to perform laboratory Proctor tests to establish a moisture-density relationship for all materials that are proposed to be used as fill.
- 3) Contractor shall give a 24-hour notice to Geotechnical testing firm when ready for Proctor, compaction, or subgrade testing and inspection.
- 4) Should any moisture-density test fail to meet specification requirements, the Contractor shall perform corrective work necessary to bring the material in compliance and retest the failed area at no additional cost to the City.

3.5 SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS

- A. **Minimum Compaction Requirements:** Compaction percentages are percentages of maximum dry density as determined by indicated ASTM Standards. Unless otherwise directed by a Geotechnical Engineer, the material shall be placed at plus or minus 20% of optimum moisture content.

Table 2200.1	
Minimum Compaction Limits	
Location	Density
Beneath and within 25 feet of buildings	100% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.
Areas under roadway pavement surfaces, shoulders, sidewalks, and curb and gutter	95% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.
Under turf, sodded, planted, or seeded non-traffic areas	90% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.

- B. Failure of Compactive Efforts:** If compaction efforts should fail to provide a stable subgrade, after subgrade materials have been shaped and brought to optimum moisture, such unstable materials shall be removed to the extent directed by either the Geotechnical Engineer or the City Engineer and replaced and compacted using new select material.

3.6 STRUCTURES: EXCAVATION, FILLING, AND BACKFILLING

See Section 02220 - *Trenching, Backfilling, and Compaction of Utilities* for excavation and backfilling for structures (manholes, etc.). See *VDOT Road and Bridge Specifications* for excavation and backfilling for retaining walls.

3.7 METHOD OF VOLUME MEASUREMENT

Contractors are required to furnish accurate counts of all excavation and/or fill moved which is to be paid for under the Contract unit price. The volumes shall be measured by either "truck tally" or by "cross-sectioning," whichever method is approved by the City Engineer or stated in the proposal and/or bid documents. When a truck count is used, the City Engineer or their representative shall verify the count independently.

A. Truck Tally Method

Excavation: When regular excavation or undercut volumes are to be counted by the truck tally method, "swell" is to be incorporated into the truck volume in the amount of 15%. Unless otherwise agreed to or justified by a Geotechnical Engineer, the following pay volumes are to be used for either regular or undercut excavation:

Tandem: 13 CY
Tri-axle: 15 CY

Borrow: When either off-site or on-site borrow is to be counted by the truck tally method, "shrinkage" is to be incorporated into the truck volume in the amount of 15% (shrinkage of truck volume placed compared to compacted fill volume) utilizing the following pay volumes:

Tandem: 10 CY
Tri-axle: 12 CY

Loading Truck: A qualified truck load is one that is loaded up to within approximately 6 inches of the top of the dump bed, prior to dumping.

B. Average-End-Method

Excavation and fill can be computed using the average-end-method. When used, this method is to be employed using the existing contours shown on the Contract Drawings and the Contractor's actual surveyed finished contours (surveyed by a licensed Professional Surveyor). In so doing, the finished contours are to be plotted at the same scale as the original drawing and a transparency furnished to the Engineer for comparison to design grades. The volume computations are also to be submitted along with the Surveyor's seal and a certification as to the volumes measured.

The Contractor, at his discretion and with the prior approval of the Engineer, may survey the "stripped" site (the site after topsoil has been removed) and compute the volumes based on the stripped site and the "designed" finished grade as shown on the Contract Drawings. As before, a transparency to the same scale and the Surveyor's computations and certification are to be submitted to the Engineer for comparison and verification.

C. Volume Formulas

Unless otherwise approved, the following formulas are to be used in computing cut and fill:

Fill Formula

Net Fill = Raw Fill Vol. – Regular Excavation X (1 - Shrink Factor) + Strip Vol.
- Undercut or waste Fill placed in Fill Slopes X (1 - Shrink Factor) - Pavement
Section or Building Floor Pad

Cut Formula

Net Cut = Raw Cut - Strip Vol. + Pavement Section or Building Floor Pad

End of Section 02200

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02220 - TRENCHING, BACKFILLING AND COMPACTION OF UTILITIES

(Revised 10/25/04)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

[Part 1- General](#)

[Part 2 – Products](#)

[Part 3 – Execution](#)

[Backfilling Trenches](#)

[Bedding Definitions](#)

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[Final Earth Backfill - Def](#)

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[Initial Earth Backfill - Def](#)

[Minimum Pipe Cover](#)

[Select Earth Backfill](#)

[Trench Backfilling](#)

[Trench Preparation](#)

[Unclassified Trench Excavation](#)

[PART 1 – GENERAL](#)

The Contractor shall furnish all labor, materials, tools, and equipment to perform all work and services necessary for or incidental to the completion of all underground utilities as shown on the drawings and as specified in the Contract Documents.

Contractor shall be responsible for coordination of work of all other trades.

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this specification.
- B. Section 01000 – GENERAL REQUIREMENTS.
- C. [Section 02720](#) – STORM DRAINAGE.
- D. [Section 02730](#) – SANITARY SEWER.
- E. [Section 02660](#) – WATER DISTRIBUTION.
- F. [Section 02500](#) – BASE COURSE AND PAVING.
- G. [Section 02200](#) – EARTHWORK.

1.2 SUMMARY

- A. This section includes:
 - 1) Excavating and backfilling trenches for buried water, sewer, and storm drainage pipe systems, buried utility structures, and appurtenances.
 - 2) Preparing subgrade for buried water, sewer, and storm drainage systems, buried utility structures and appurtenances.

- B. Construction and materials related to this section but specified in other specification sections:
 - 1) Section 01000 – *General Requirements*: Landscaping, Seeding and Groundcover, and Erosion Control.
 - 2) Section 02200 – *Earthwork*: site clearing, grubbing, topsoil removal, tree protection, roadway, and paving.

1.3 DEFINITIONS

For the purposes of this specification, the following definitions refer to sanitary sewer, storm drainage and water distribution systems that come under the authority of the City of Lynchburg, Virginia as specified within this section and other sections of this manual.

- A. **Backfill**: Soil materials used to fill an excavated trench:
 - 1) **Initial Backfill** (Select Earth Backfill): Backfill placed beside and 12 inches over the top of the pipe in a trench, including haunches to support sides of pipe.
 - 2) **Final Backfill** (Common Earth Backfill): Backfill placed over the initial backfill to fill a trench.
- B. **Bedding Course**: Layer placed over the excavated subgrade in a trench before laying pipe.
- C. **Foundation Stone**: Clean well-graded stone, authorized by the City Engineer, used to strengthen and/or provide support to an otherwise weak subgrade. Foundation stone is placed, and the subgrade improved before bedding stone is placed.
- D. **Trench Rock Excavation**: Removal and satisfactory disposal of all unsuitable materials, which, in the opinion of the City Engineer, cannot be excavated except by drilling, blasting, wedging, jack hammering or hoe ramming. It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than ½ cubic yard and/or solid ledges, bedded deposits, unstratified masses and conglomerations of material so firmly cemented as to possess the characteristics of solid rock which cannot be removed without systematic drilling, blasting, or hoe ramming will be classified as rock.
- E. **Structures**: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- F. **Subgrade**: Surface or elevation remaining after completing the trench excavation or, the top surface of a backfill (stone or soil) immediately below the pipe conduit or pipe bedding, as applicable.

- G. **Trench Borrow (Select):** Trench borrow shall consist of approved material imported from off-site for use as fill or backfill required to be placed in trenches either as initial select earth backfill or final common earth backfill. Trench borrow shall not be used until all suitable trench excavation material has been placed in the trench, unless authorized by the City Engineer. The Contractor shall make his own arrangements for obtaining borrow and pay all costs involved, unless otherwise designated on the plans and in the contract documents. Borrow material must be approved by the City Engineer prior to use.
- H. **Regular Excavation:** Removal and disposal of any and all material above subgrade elevation, except solid rock and undercut excavation, located within the limits of construction.
- I. **Undercut Excavation:** Undercut excavation shall consist of the removal and satisfactory disposal of all unsuitable material located below subgrade elevation. Where excavation to the finished grade section results in a subgrade or slopes of muck, peat, matted roots, etc., the Contractor shall remove such material below the grade shown on the plans or as directed; and areas so excavated shall be backfilled with approved select earth borrow or stone as directed by the City Engineer.

1.4 SUBMITTALS

- A. Submit product data for and a sample of the following in accordance with Section 01000, *General Requirements*. Fully document each with specific location or stationing information, date and other pertinent information.
 - 1) Stabilization/Separation fabric
 - 2) Drainage Fabric
 - 3) Metallic locating tape
- B. **Material Test Reports:** Provide from a qualified testing agency test results and interpretation for compliance of the following requirements indicated:
 - 1) Classification according to ASTM D2487 of each on-site or borrow soil proposed for backfill, unless otherwise directed by the City Engineer.
 - 2) Laboratory compaction curve according to ASTM D698 for each on-site or borrow soil material proposed for backfill.
- C. **Blasting:** See Section 01000 – *General Requirements*.
- D. **Bury Depth Computations:** Computations justifying pipe bury when bury depth exceeds the allowable depth shown in this specification. Provide method, applicable charts/graphs, print outs, assumptions, etc.

1.5 QUALITY ASSURANCE

- A. **Geotechnical Testing Agency Qualifications:** An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing as documented according to ASTM D 3740 and ASTM E 548.
- B. Comply with all codes, laws, ordinances, and regulations of governmental authorities having jurisdiction over this part of the work.
- C. The Contractor shall comply with the latest revision of the Virginia Occupational Safety and Health Standards for the Construction Industry as adopted by the Safety and Health Codes Commission of Virginia.
- D. The Contractor shall comply with Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, "Virginia Erosion and Sedimentation Control Handbook," latest revision.
- E. Comply with applicable requirements of NFPA 495, "*Explosive Materials Code*."
- F. Comply with "*Gravity Sanitary Sewer Design and Construction*," ASCE Manuals and Reports on Engineering Practice – NO. 60, WPCF Manual of Practice NO. FD-5.
- G. Comply with Uni-Bell PVC Pipe Association "*Handbook of PVC Pipe: Design and Construction*," 3rd ed. Dallas: UNI, 1991 for the installation of PVC piping, latest revision.
- H. Materials and operations shall comply with the latest revision of the Codes and Standards listed below:

American Society for Testing and Materials

ASTM C 33	Concrete Aggregates.
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³) (Standard Proctor).
ASTM D 1556	Standard Method of Test for Density of Soil in Place by the Sand-Cone Method.
ASTM D 1557	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (Modified Proctor).
ASTM D 2049	Standard Method of Test for Relative Density of Cohesionless Soils.
ASTM D2167	Standard Method of Test for Density of Soil in Place by the Rubber-Balloon Method.
ASTM D 2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

ASTM D 2922	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
ASTM D 4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
ASTM D 4254	Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

American Association of State Highway & Transportation Officials

AASHTO T99	The Moisture-Density Relations of Soils using a 5.5-pound Rammer and a 12-inch drop.
AASHTO T180	The Moisture Density Relations of Soils using a 10-pound Rammer and an 18-inch drop.
AASHTO M 145	The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

American Water Works Association

AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances.
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1.6 STANDARD ABBREVIATIONS

ANSI	American National Standards Institute
AREA	American Railway Engineers Association
DEQ	Department of Environmental Quality
DIP	Ductile Iron Pipe
MSDS	Material Safety Data Sheets
OHSA	Occupational Safety and Health Administration
PVC	Polyvinyl Chloride Plastic Pipe
RCP	Reinforced Concrete Pipe
PCP	Plain Concrete Pipe (Non-Reinforced)
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation

1.7 TESTING SERVICES

- A. The Testing Laboratory shall be selected by the Contractor/Developer and approved by the City Engineer and will be responsible for conducting and interpreting tests. The Testing Laboratory shall state in each report whether or not the test specimens conform to all requirements of the Contract Documents and specifically note any deviation.
- B. Specific test and inspection requirements shall be as specified herein.

1.8 PROJECT CONDITIONS

- A. **Demolition:** Demolish and completely remove from the site existing underground utilities indicated on the plans to be removed.
- B. **Environmental:** Before crossing or entering into any jurisdictional wetlands, Contractor shall verify whether or not a wetlands permit has been obtained for the encroachment and whether special restrictions have been imposed. Care shall be taken to prevent draining or otherwise destroying non-permitted wetlands. Restore as stated on either the project drawings, the contract documents, and/or as noted in the permit.

1.9 COORDINATION

- A. At the direction of the City Engineer, temporary pumping/bypass of sewerage flow may be required to be provided. See Section 02730 - *Sanitary Sewer* for bypass pumping requirements and procedures.
- B. See Section 02660 – *Water Distribution* for valve operation requirements.
- C. Coordinate tie-ins to municipal system with the City of Lynchburg.
- D. When traffic signals or their appurtenances are likely to be damaged or interfered with as a result of the construction, coordinate temporary operation with the City of Lynchburg Traffic Engineer. Provide a minimum of 48 hours notice prior to anticipated disturbance or interruption.

PART 2 – PRODUCTS

2.1 BEDDING AND BACKFILL

- A. **Backfill Around Structures:** Backfill shall be approved by the City Engineer and shall be free from large or frozen lumps, wood, or rocks more than 3 inches in their greatest dimension or other extraneous material. Porous backfill shall conform to the requirements of applicable sections of the VDOT *Road and Bridge Specifications*.
- B. **Bedding Material:** VDOT #57, #68, or #78 stone.
- C. **Coarse Aggregate Backfill:** See applicable VDOT *Road and Bridge Specifications* for properties and gradation of VDOT #57 stone.

D. Common Earth Backfill

- 1) **Satisfactory Soils:** ASTM D 2487 soil classification group (Unified Classification System) GW, GP, GM, SW, SM, SC, ML, and CL or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 2) **Unsatisfactory Soils:** ASTM D 2487 soil classification group CH, MH, OH, OL and PT; soils which contain rock or gravel larger than 3 inches in any dimension, debris, waste frozen materials, vegetation, and other deleterious matter. Unsatisfactory soils also include satisfactory soils not maintained within 20-percent of optimum moisture content at time of compaction, unless otherwise approved by the City Engineer.
- E. Dense Graded Aggregate Backfill:** VDOT #21A stone.
- F. Excavation:** All excavation material shall be classified as either Rock or Regular Earth Excavation.
- G. Flowable Fill Concrete Backfill:** Concrete strength shall be liquid enough to flow, be self-leveling, and have an ultimate minimum strength 225 psi (this product is a combination of sand and Portland cement).
- H. Foundation Stone:** Foundation/Trench Stabilization Material: VDOT #1 or #2 stone.
- I. Select Earth Backfill:** Select earth backfill shall be free of debris, roots, frozen materials, organic matter, rock, or gravel larger than 1 inch in any dimension, or other harmful matter and shall generally meet VDOT *Road and Bridge Specifications*, Section 207 – *Select Material* for properties and gradation. Sand and rock dust are acceptable materials.
- J. Topsoil:** Topsoil shall consist of friable clay loam, free from roots, stones, and other undesirable material and shall be capable of supporting a good growth of grass. Topsoil shall be free of material greater than 1 inch in any dimension.

2.2 MISCELLANEOUS**2.2.1 GEOTEXTILE FABRIC**

See the Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, *Virginia Erosion and Sedimentation Control Handbook*, latest edition.

2.2.2 METALLIC LOCATING TAPE

Acid and alkali resistant polyethylene film tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

Blue: Water Systems

Green: Sewer systems

PART 3 – EXECUTION

3.1 PREPARATION

3.1.1 GENERAL REQUIREMENTS APPLYING TO ALL AREAS

- A. Contractor shall plan construction to minimize disturbance to properties adjacent to the sewer, water, and storm lines.
- B. The City Engineer reserves the right to limit the width of land to be disturbed and to designate on the drawings or in the field certain areas or items within this width to be protected from damage.
- C. Any grading or excavation required for equipment travel during the course of construction as well as erosion control, access or haul road installation and removal, restoration, seeding and ground cover shall be provided by the Contractor at no additional cost.
- D. The Contractor shall be responsible for damage to areas or items designated by the City Engineer to be protected. Repairs to, replacement of, or reparations for areas or items damaged shall be made at the Contractor's expense to the satisfaction of the City Engineer before acceptance of the completed project.
- E. The Contractor shall protect all buildings, structures, and existing utilities located along the utility line. Hand trenching, shoring, or other methods may be required at no additional cost.
- F. Any fences disturbed by the Contractor shall be repaired to a condition equal to or better than their original condition or to the satisfaction of the City Engineer at no additional cost.
- G. Contractor shall obtain written permission from property owners for use of any access other than ones located within rights-of-way. Written permission shall contain conditions for use and restoration agreements between property owner and Contractor. No additional compensation will be made for such access.
- H. All areas disturbed shall be restored to a condition equal to or better than their original condition and shall be graded to drain.

- I. The Contractor shall replace or repair all damaged or destroyed hedgerows and property corners. Protection of and restoration of damaged or destroyed property corners shall be in accordance with the requirements of Section 01000 – *General Requirements*, Construction Staking.
- J. When a property owner requests that a tree(s) within construction limits remain, a waiver shall be signed between the property owner and the City.

3.1.2 CONSTRUCTION LIMITS

- A. Contractor shall not disturb any areas outside the limits contained in this section without the express written permission from the City Engineer.
- B. The following widths measured from the centerline of the sewer, water, and storm drainage lines shall be considered the allowable working area and be referred to as the “construction limits.”

Pipe Size	Distance from C/L	Total Allowable Width
12" or smaller	15 feet	30 feet
15" to 18"	20 feet	40 feet
24" and larger	25 feet	50 feet

The Contractor shall protect all areas outside these construction limits unless written variations are granted by the City Engineer.

3.1.3 CLEARING AND GRUBBING

- A. This work shall consist of clearing, grubbing, removing, and disposing of all vegetation and debris within the limits of construction, as designated on the plans or as required by the City Engineer. The work shall also include the preservation from injury or defacement of all vegetation or objects designated to remain.
- B. The Contractor shall clear and grub the surface as required for the full length of the trench within the rights of way or easements or within the construction limits indicated on the drawings. The width shall not exceed that width as specified herein. The Contractor shall remove only those trees and shrubs absolutely necessary to allow for the construction.
- C. Prior to commencement of clearing, Contractor shall notify the City Construction Coordinator 48 hours in advance.
- D. The Contractor shall provide barricades, fences, coverings, or other types of protection necessary to prevent damage to existing improvements, not indicated to be removed, and improvements on adjoining property. All improvements damaged by this work shall be restored to their original condition or to a condition acceptable to the owner or other parties or authorities having jurisdiction.

E. Protection of Trees and Vegetation

Contractor shall protect existing trees and other vegetation indicated by the City Engineer to remain in place against cutting, breaking, or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fences or barricades as required to protect trees and vegetation to be left standing at no additional cost.

Trees and shrubs that are to remain within the construction limits will be indicated on the drawings or conspicuously marked on site.

Carefully and cleanly cut roots and branches of trees indicated to remain where the roots and branches obstruct construction of the utility line. If directed by the City Engineer, the Contractor shall provide protection for roots and branches over 1 ½ inches diameter that are cut during construction operations. Temporarily cover all exposed roots with wet burlap to prevent roots from drying out. Provide earth cover as soon as possible.

Damaged trees and vegetation designated to remain shall be repaired or replaced at Contractor's expense in a manner acceptable to the City Engineer if they are damaged by construction operations. Repair tree damage as directed by a qualified tree surgeon.

- F. All brush, tree tops, stumps, and debris shall be hauled away and disposed of in accordance with applicable laws and regulations. The Contractor shall clean up debris resulting from clearing operations continuously with the progress of the work and remove promptly all salvageable material that becomes his property and is not to be reused in construction. Sale of material on the site is prohibited. Debris from the site shall be removed in such a manner as to prevent spillage. Keep pavement and area adjacent to site clean and free from mud, dirt, dust, and debris at all times. Unless otherwise noted, all trees with diameters of 6 inches or larger, measured at the base, cut on any project shall be cut into fireplace lengths, 24 inches, stacked within the "construction limits" at a location suitable to the property owner. Contractor shall not remove any wood from this project without written authorization from the City Engineer. No additional compensation shall be made if removal of trees from property is required.
- G. The method of stripping, clearing, and grubbing the site shall be at the discretion of the Contractor. However, all stumps, roots and other debris protruding through the ground surface or in excavated areas shall be completely removed and disposed of off the site by the Contractor, at his expense.
- H. Remove the existing topsoil to a depth of 6 inches or to the depth encountered from all areas in which excavation will occur. The topsoil shall be stored in stockpiles, separate from the excavated trench material, if the topsoil is to be respread. Otherwise, material shall be disposed of off-site at the Contractor's expense.

I. Specific Requirements Applying to Developed Subdivision/Lots

- 1) All trees located beyond 7.5 feet of the centerline of the sewer, water, or storm drainage line shall be protected by the Contractor. The City Engineer reserves the right to designate other trees located closer to the centerline for protection where possible.
- 2) All shrubs, hedges, or other ornamental plantings located along the line shall be protected or removed and replanted by the Contractor and guaranteed within the warranty period at no additional cost.
- 3) The Contractor shall protect septic systems, wells, or springs.
- 4) Damage to lawns shall be kept to the absolute minimum necessary for construction.
- 5) Excavated or blasted rock shall be removed from the site unless otherwise ordered by the City Engineer.

3.1.4 PROTECTION OF EXISTING UTILITIES

- A. Contractor is responsible for protection of existing utilities in accordance with Section 01000 – *General Requirements*.
- B. Should it become necessary to move the position of any underground structure, the Contractor may be required to do such work and shall be paid on a force account basis or on an extra work basis as specified in Section 01000 – *General Requirements*. Method of payment shall be agreed upon by the City Engineer and the Contractor prior to commencing work.
- C. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the City Engineer and secure instructions. Do not proceed with permanent relocation of utilities until instructions are received from the City Engineer.

3.1.5 PROTECTION OF SURFACE FEATURES

Refer to Section 01000 – *General Requirements*.

3.1.6 PROCEDURES FOR REPAIRING DAMAGED UTILITIES

Refer to Section 01000 – *General Requirements*.

3.1.7 PROTECTION OF PERSONS AND PROPERTY

Refer to Section 01000 – *General Requirements* for requirements relating to protection and restoration of property.

3.2 TRENCH EXCAVATION

3.2.1 GENERAL

A. Pipe Cover

Minimum Cover: Unless shown otherwise on the construction documents, provide minimum trench depth indicated to maintain a minimum cover over the top of the installed item. Minimum cover on pipe is measured from top of pipe to original ground or proposed finished grade as applicable and shall be per standard details. When minimum cover cannot be maintained, alternate construction shall be approved by the City Engineer. For minimum cover requirements, see Section 02730 – *Sanitary Sewer*, Section 02660 – *Water Distribution*, and Section 02720 – *Storm Drainage*, as applicable.

- B. Remove all material from trench limits. Material of a compactible nature that can be re-used as trench backfill shall be re-installed and re-compacted to the requirements set forth in these specifications.
- C. At the Contractor's expense, dispose of all unsatisfactory material, of what ever nature, to a site which legally can accept such material as fill. Adhere to all applicable laws and ordinances regarding permitting of waste site, erosion control, zoning, etc. as may be applicable.
- D. Material of an uncompactable nature, material unsatisfactory for backfill, trash and excess material shall be removed from project site and disposed at the Contractor's expense. Where removal of unsatisfactory material is due to negligence on the part of the Contractor (i.e. resulting from inadequate shoring or bracing, failure to dewater, improper material storage exposing it to rain or flooding, or other failure to meet specified requirements), work shall be performed at no additional cost to the City. If additional material is required, the Contractor shall supply same from an approved borrow pit at no additional cost the City.

3.2.2 TRENCHING

- A. Where the utility line is in an existing paved area, the pavement shall be saw cut in a straight line parallel to the pipe on each side. Saw cutting operations shall be performed prior excavation to avoid excessive removal of asphalt. Care shall also be taken during the installation of pipe to avoid damage to adjoining paved surfaces.
- B. All trenches shall be excavated to the lines and grades as shown on the plans. Trenches for water lines may be curved within the limits of curvature of the pipe as allowed by AWWA C600.
 - 1) **Trench Width:** The sides of trench shall be uniform and vertical. See **Standard Detail 27.01** for trench width for sanitary sewers and storm sewers and **Standard Detail 26.01** for water lines.

- 2) **Trench Depth:** All trenches shall be excavated to accommodate the bedding as required in [Table 2220.1](#) and as shown in **Standard Details 27.01 and 26.01**, as applicable. No extra compensation will be made for stone bedding used to bring the trench up to grade other than that required in **Standard Details 27.01 and 26.01**, as applicable and specified in [Table 2220.1](#).

In excavating for the trench, it is essential that the trench bottom be uniform in grade and remains static during backfilling and under all subsequent trench conditions. The grade of the bottom of the trench shall be graded to within 0.04 foot (1/2-inch) of the plan specified grade. The stone shall be graded to the same tolerance.

Care shall be taken not to over excavate the trench. Refer to [paragraph 3.2.4](#) for over excavation specification.

- 3) **Open Trench Exposure:** Once trench is opened, proceed immediately to place specified materials in trench, or to otherwise utilize trench for intended purpose. Schedule work and order materials so that trenches are not left open for a longer period than is reasonably necessary and do not extend length limits specified in applicable specifications.

3.2.3 TRENCH ROCK

When rock is encountered in the trench, the City Construction Coordinator or City Engineer must be notified before any rock is blasted or removed. The City Engineer or his representative will measure the rock, after which, the rock shall be excavated. Rock shall be removed from the construction site unless otherwise approved by the City Engineer. See Section 01000 – *General Requirements* for blasting requirements.

3.2.4 PREPARATION OF FOUNDATION FOR PIPE LAYING

- A. The bedding surface shall provide a firm, stable, and uniform support through the entire length of the pipe.
- B. **Unsuitable Trench Subgrade/Foundation Improvement:** Notify the City when unstable materials are encountered and define by drawing station locations and limits where encountered. If the trench subgrade is found to be soft, spongy, excessively wet, unstable or in any other way unfit such that there is inadequate pipe support, when directed by the City Engineer or City Construction Coordinator, the material shall be removed for the full width of the trench, and the excavated area shall be strengthened for foundation purposes by furnishing and placing either approved crushed stone, a concrete cradle, concrete mud mat, concrete encasement or a combination of these materials. Whenever the bottom of the trench is such that it cannot be reasonably stabilized, the City Engineer may require the pipe to be laid in cradles supported on piles. These foundations shall be placed as directed by the City Engineer.

- C. **Over Excavation:** Exercise care to avoid excavations below established grade where firm earth conditions exist. Unauthorized over-excavation consists of removal of material beyond indicated subgrade elevations or side dimensions, without specific approval of the City Engineer. Unauthorized excavation shall be replaced at Contractor's expense. Where unauthorized excavations have been carried beyond points required, restore these areas to the elevations and dimensions shown on the drawings with approved fill material and compact as specified. If over-excavation occurs, such over excavation shall be replaced with clean VDOT #57 stone.

3.2.5 DEWATERING

- A. When ground water is encountered, the Contractor shall pump or otherwise remove any water that accumulates in the trenches or pits and shall perform all work necessary to keep the trenches or pits clear from water while pipe is being laid, masonry units are being placed, and structures are either being set or constructed. All water removed from the trench shall be conveyed in a proper manner to a suitable point of discharge and shall comply with applicable erosion and sediment control laws at no additional cost. If pumping is required between the hours of 8:00 p.m. and 6:00 a.m., engines shall be equipped as specified in Section 02730 - Sanitary Sewer, paragraph 3.5E, in order to keep noise to a minimum.
- B. No pipe shall be constructed in water and water shall not be allowed to drain through the pipe. The open end of the pipe shall be kept closed with a tight fitting plug to prevent washing of any foreign matter into the line.
- C. No structure shall be constructed in water and water shall not be allowed to flow over or rise upon any concrete or masonry structure until the work has been accepted.
- D. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches. Reroute surface water runoff away from or around excavated areas.

3.2.6 TRENCH PREPARATION FOR PIPE

A. Preparation of Trenches for Gravity Pipelines

Depending upon the bedding class, the bottom of the trench for gravity pipelines shall be excavated to a minimum over depth as indicated in [Table 2220.1](#) to provide for improved pipe bedding material for the entire length of the gravity pipeline, including sewer lateral connections, except in rock where bedding shall be a minimum of 6 inches deep (see **Standard Detail 27.01**). Rock larger than 3 inches shall be removed from the trench bottom and any voids filled with soil or clean stone. The bedding shall be shaped so that the bottom quadrant of the pipe rests on the bed. Bell holes and depressions as required of the joint shall be dug after the bedding has been graded and shaped, and shall be only of such length, depth, and width as required for properly making the particular type of joint. The trench for sanitary sewers, sanitary sewer lateral connections, and storm drainage lines shall then be backfilled as indicated in [Section 3.4 - Backfilling](#).

B. Preparation of Trenches for Water Mains

When bedding is required, the bottom of the trench for pipe line shall be excavated to a minimum over depth as indicated in [Table 02220.1](#). The trenches for water lines shall be graded to avoid local high points. Trenches shall be graded either level or on a continuous upslope to the high points designated on the drawings. Trenches shall be of such depth as to provide a minimum cover over the top of the pipe as noted in [Section 1.8 – Project Conditions](#). Pipe shall not bridge any areas. Rock larger than 3 inches shall be removed from the trench bottom and any voids filled with soil or clean stone. Bell holes shall be provided at each joint to permit proper joint assembly and proper pipe support. Rock shall be removed 6 inches below pipe and bedding shall be a minimum of 6 inches. The trench for water lines shall then be backfilled as indicated in [Section 3.4 – Backfilling](#).

3.2.7 TRENCHING IN FILLS

In areas where trenching for pipes will be in fills, the fills shall be brought to an elevation of at least 12 inches above the top of the pipe, and then the trench excavated in the compacted fill, as herein specified for trench excavation.

3.2.8 EXCAVATION FOR APPURTENANT STRUCTURES

- A. Excavate for appurtenant structures to provide at least 12 inches (minimum) clear distance between outer surface of the structure and undisturbed earth.
- B. Where rock is encountered so that a built-in-place manhole, precast structure (such as a manhole or vault), or other structure will bear over rock, remove the rock to a minimum of 12 inches below the foundation or footing of the structure and place an 12-inch cushion of VDOT #57 stone over the rock.

3.2.9 DEPOSITION OF EXCAVATED MATERIAL

All excavated material shall be placed in accordance with all applicable OSHA and State and local erosion and sedimentation regulations.

3.3 BEDDING

3.3.1 PIPE BEDDING CLASS DEFINITIONS

- A. **Class D Bedding** is that condition existing when the ditch is excavated slightly above grade by excavation equipment and cut to finish grade by hand. Bell holes are dug, to prevent point loading the pipe bells, so that pipe bears uniformly upon the trench bottom. Existing soil should be shovel sliced or otherwise compacted under the haunching of the pipe to provide some uniform support. The backfill to the ground surface is to be compacted to the density specified in [Table 02220.2](#). In poor soils, granular bedding material is generally a more practical, cost effective installation. The bedding factor for class D bedding is 1.1.

- B. **Class C Bedding** is that condition where the pipe is bedded in compacted granular material. The granular bedding has a minimum thickness of one-eighth the outside pipe diameter, but not less than 4 inches or more than 6 inches, and shall extend up the sides of the pipe one-eighth of the pipe outside diameter. The backfill to ground surface is to be compacted to the density specified in [Table 02220.2](#). The bedding factor for class C bedding is 1.5.
- C. **Class B Bedding** is that condition where the pipe is bedded in carefully compacted granular material. The granular bedding has a minimum thickness of one-eighth the outside pipe diameter, but not less than 4 inches or more than 6 inches, between the barrel and the trench bottom, and covering the full width of the trench and shall extend to the spring line.

The haunch area of the pipe must be fully supported; therefore, the granular material should be shovel sliced or otherwise compacted under the pipe haunch to the springline of the pipe. Both granular haunching (to the springline) and initial backfill to a minimum depth of 12 inches over the top of the sewer pipe should be placed and compacted. The remainder backfill to the ground surface is to be compacted to the density specified in [Table 02220.2](#). The bedding factor for class B bedding is 1.9.

- D) **Class B-1 Bedding** (*PVC pipe applications*) is the same as Class B Bedding except that granular backfill is placed to the top of the pipe rather than to the springline of the pipe. The backfill to the ground surface is to be compacted to the density specified in [Table 02220.2](#).
- E) **Class A Bedding** is that condition when the pipe is bedded in a cast-in-place cradle of either plain or reinforced concrete having a thickness equal to one-fourth the inside pipe diameter, with a minimum of 4 inches and a maximum of 15 inches under the pipe barrel and extending up the sides for a height equal to one-fourth the outside pipe diameter. The cradle width shall have a width at least equal to the outside diameter of the sewer pipe barrel plus 8 inches. The bedding factor for class A bedding is 2.2.

The haunching and initial backfill material above the concrete cradle should be crushed stone or a well graded granular material and carefully compacted to 12 inches above the crown of the pipe. The backfill to the ground surface is to be compacted to the density specified in [Table 02220.2](#).

3.3.2 MINIMUM BEDDING REQUIREMENTS (by application and type of pipe)

Table 2220.1			
Minimum Bedding Class			
Application	Pipe Material	Pipe Size	Minimum Bedding Class
Sewer			
	PVC	6-inches or smaller	Class B-1 ^a (stone to top of pipe)
	PVC	8-inch thru 15-inch	Class B-1 ^a (stone to top of pipe)
	DIP	4-inch thru 24-inch	Class C
	RCP	>24-inch	Class C
Water			
	DIP	Up to 16 inches	Class D
	DIP	≥ 16 inches	Class C
Storm			
	RCP inside R/W	Thru 36 inches	Class C
	RCP outside R/W	Thru 36 inches	Class D
	PCP outside R/W	Thru 24 inches	Class D
	RCP	> 36 inches	Class C
	DIP	15 thru 24 inches	Class C

^aThe approximate long-term deflection in different burial conditions (bedding classes, depth, degree of compaction, type backfill soil, etc.) generally can be calculated using the Modified Iowa Formula developed by Spangler and Watkins.

Bedding requirements when rock is encountered: When rock is encountered excavate to a depth of 6 inches below pipe and provide granular pipe bedding at a depth of 6 inches between pipe barrel and trench bottom. The bedding shall extend up the sides of the pipe 1/8 of the pipe outside diameter.

3.3.3 BEDDING FOR STRUCTURES

The bottom of structure excavations shall be excavated to minimum over depth of 12 inches below the bottom of the structure to provide for stone bedding. Bedding material shall be shaped and graded so that the entire bottom of the structure rests on the material for its entire area.

3.4 BACKFILLING

A. General

- 1) Reopen trenches that have been improperly backfilled, to a depth as required for proper compaction. Refill and compact as specified, or otherwise correct to the approval of the City Engineer and at no additional cost to the City.
- 2) Should any of the work be so enclosed or covered up before it has been approved, uncover all such work and, after approvals have been made, refill and compact as specified, all at no additional cost to the City.
- 3) Observe specific pipe manufacturer's recommendations regarding methods of backfilling and compaction.

- 4) Insure compaction of each lift to requirements stated in these specifications.
- 5) All trenches shall be backfilled prior to the completion of the day's work unless otherwise directed or permitted by the City Engineer.
- 6) Exercise extreme care in backfilling operations to avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion. Repair damages, distortions, or misalignments to full satisfaction of the City Engineer.

B. Methods

- 1) **Select Earth Backfill:** Furnish select earth backfill where indicated on drawings and specified for compacted backfill conditions up to 12 inches above top of pipe. Comply with the following:

Care shall be taken to prevent any disturbance to the pipe or damage to newly made joints. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that injurious side pressures do not occur such that the pipe could be displaced or dislodged. Do not backfill on muddy or frozen soil.

Sheeting and shoring generally should be removed only when the trench below it has become substantially filled, and every precaution shall be taken to prevent any slides of material from the sides of the trench onto or against the pipe.

- a. Hand place, shovel slice, and pneumatically tamp all select earth backfill.
- b. Place backfill in lifts not exceeding 6 inches (loose thickness).

- 2) **Common Earth Backfill:** Comply with the following:

- a. Unless otherwise specified or approved by the City Engineer, backfill the remainder of the trench, from 1 foot above the pipe to grade, with common earth fill. Before placing any backfill, all rubbish, forms, blocks, wires, or other unsuitable material shall be removed from excavation. The backfilling shall be placed in layers not over 6 inches.
- b. All areas within the limits designated on the drawings, including adjacent transition areas, shall be uniformly graded. The Contractor shall finish surfaces within the specified tolerances with uniform levels or slopes between points where elevations or existing grades are shown.
 - i. Finish subgrade areas that are to receive topsoil. Bring such areas to within 0.10 foot of required subgrade elevations.
 - ii. Shape subgrade under sidewalks to line, grade, and cross-section. Subgrade is to be brought to within 0.10 foot of required subgrade elevations.
 - iii. Shape subgrade under pavement to line, grade, and cross-section. Bring to within ½ inch of required subgrade elevations.

- c. The Contractor shall protect newly graded areas from traffic and erosion and repair and re-establish grade in settled, eroded, or rutted areas. Where compacted areas are disturbed by subsequent construction or adverse weather, the Contractor shall scarify the surface, reshape, and re-compact to the required density. If the Contractor shall fail to maintain any trench within 2 days after receipt of written notice from the City Engineer, the City Engineer may refill the said depressions and the cost of such work may be retained from monies due the Contractor or billed directly to the Contractor. In case of emergency, the City Engineer may refill any dangerous depressions without prior notice to the Contractor.
- 3) **Structure Backfill:** Take care to prevent wedging action of the backfill against structure by carrying the material uniformly around the structure so approximately the same elevation is maintained in each lift. The Contractor shall refill all excavations as rapidly as practical after completion of the structural work therein, or after the excavations have served their purpose.
- 4) **Aggregate Backfill**
 - a. **Dense Graded Aggregate Backfill:** When select earth backfill/borrow cannot be obtained, dense graded aggregate may be substituted with the City Engineer's approval.
 - b. **Coarse Aggregate Backfill:** In confined areas where compaction cannot be achieved, coarse aggregate may be substituted with the City Engineer's approval.

3.5 COMPACTION/DENSITY

- A. **Quality Assurance (QA):** In the course of backfilling trenches for utility installations, the City Engineer may require "Field Density Determinations" or compaction tests. When compaction tests are called for, the City Engineer will determine the location of the tests and the Developer (Owner) shall engage a qualified testing firm to perform the test. Field density determinations shall be performed in accordance with AASHTO T191, T205, and T214, modified to include material sizes used in the laboratory determination of density with nuclear field density testing device or by other approved methods. A representative of the City Engineer will observe tests and a copy of the test results and inspection report will be submitted by the testing firm directly to the City Engineer or his/her representative. When the test results indicate that the density is less than the percent specified, the Contractor shall excavate and re-compact the areas that have failed at no expense to the City. Payment for failed compaction test shall be made by the Contractor by deducting the cost from the forthcoming retainage or billed directly to the Contractor.
- B. Soil shall be compacted using equipment suitable for the material and the work area location.

- C. **Compaction Requirements:** Unless noted otherwise on drawings or more stringently by other sections of these specifications, place and insure backfill and fill materials achieve an equal or "higher" degree of compaction than undisturbed materials adjacent to the work; however, in no case shall degree of compaction fall below the following percentages of the maximum density at optimum moisture content. Tolerance is to be within +/- 20 percent of the optimum moisture content.

Table 2220.2	
Minimum Compaction Limits	
Location	Density
Beneath and within 25 feet of buildings	100% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.
Areas under roadway pavement surfaces, shoulders, sidewalks, and curb and gutter	95% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.
Under turf, sodded, planted, or seeded non-traffic areas	90% of the maximum dry density by ASTM D 698 (Standard Proctor), AASHTO T-99.

- D. **Minimum Compaction Testing Frequency:** Refer to Section 02200 – *Earthwork*, paragraph 3.4 – Subgrade Compaction Testing and Control.

3.6 SERVICE CUTS, DIRECTIONAL BORED OR PUNCHED SERVICES

- A. **Open Trenches:** Sewer lateral and water service connections that cross paved streets shall be installed by saw cutting the pavement and opening the trench.

Lateral and service connection trenches shall be backfilled as specified for gravity sewers and for water lines, as applicable. See [Section 1.8 – Project Conditions](#) of this specification.

- B. **Directional Boring or Punching:** At the direction of the City Engineer, service pipes may be required to be “punched” or “directional bored” beneath the pavement.

3.7 PAVEMENT REPAIR AND REPLACEMENT

Refer to specification Section 02500 – *Base Coarse and Paving*.

3.8 HIGHWAY CROSSING

Refer to specification Section 02730 – *Sanitary Sewer* and Section 02660 – *Water Distribution*.

3.9 MISCELLANEOUS

3.9.1 IDENTIFICATION OF NEW SANITARY SEWER LINES (Metallic Locating Tape)

Placement of locating tape during backfill operations shall be required on all newly installed non-metallic mains and service laterals. The metallic locating tape shall be per [paragraph 2.2.2](#) of this specification and located no more than 12 inches below the final grade.

3.9.2 FLOWABLE FILL CONCRETE BACKFILL

When directed by the City Engineer, the Contractor shall backfill trenches or undercut areas with flowable fill concrete plant mix. Except for structural applications, traffic can be placed on mixture within an hour or two after placement. Final surfacing of pavements; however, should be delayed if possible at least 24 hours to allow for shrinkage and hydration of concrete. Settlement of 2 to 3 inches is to be expected.

3.9.3 SALVAGE OF USEABLE MATERIALS

Useable materials include paving blocks, Belgium blocks, Bluestone, brick, castings, and pipe etc., removed during excavation that are useable on this project or future projects as determined by the City Engineer. Such material shall be stockpiled on site or as directed by the City Construction Coordinator at no additional cost to the City. Unnecessary abuse and damage to these items shall be the Contractor's responsibility and the cost of replacement may be deducted from the retainage.

End of Section 02220

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02400 - CURB & GUTTER, DRIVEWAYS & SIDEWALKS

(Revised 10/25/04)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

[Part 1- General](#)
[Part 2 – Products](#)
[Part 3 – Execution](#)
[Concrete](#)

[Curing](#)
[Curb and Gutter](#)
[Facedown Sidewalk](#)
[Flumes & Ditches](#)

[Sidewalk](#)
[Reinforcement](#)
[Testing](#)
[Welded Wire Fabric](#)

[PART 1](#) – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this specification.
- B. Section 01000 – GENERAL REQUIREMENTS.
- C. [Section 02200](#) – EARTHWORK.
- D. Any Specifications or details not covered herein shall be per Virginia Department of Transportation, *Road and Bridge Specifications*, 2002 or latest revision.

1.2 SUMMARY

This section includes concrete curbs, combination curb and gutters, ramps, sidewalks, driveways, flumes, valley gutters, median strips, islands, retaining walls, steps, and headwalls on municipal roadways and its appurtenances.

1.3 DEFINITIONS

For the purposes of this specification, the following definitions refer to the streets and roadway system that comes under the authority of the City of Lynchburg, Virginia as specified within this section and other sections of this manual.

Street or Roadway: A publicly dedicated street or roadway right-of-way maintained by the City of Lynchburg Virginia

1.4 SUBMITTALS

Submit product data and shop drawings for the following in accordance with Section 01000, *General Requirements*:

- A. Air Entrainment
- B. Concrete cylinder break tests.
- C. Concrete admixtures
- D. Joint Sealants and expansion joint material
- E. Job mix formula
- F. Other embedded items

1.5 QUALITY ASSURANCE

Materials and operations shall comply with the latest revision of all applicable Codes and Standards.

1.6 STANDARD ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
ACI	American Concrete Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
C&G	Concrete Curb and Gutter
CRSI	Concrete Reinforcing Steel Institute
FS	Federal Specifications
MSDS	Material Safety Data Sheets
VDOT	Virginia Department of Transportation
WWF	Welded Wire Fabric

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Concrete Handling/Transportation

- 1) Hydraulic cement concrete plant operations shall comply with the latest revision of VDOT *Road and Bridge Specifications*.
- 2) Time limitations and intervals between deliveries shall be in accordance with Section 217.09 of the VDOT *Road and Bridge Specifications* or latest revision.
- 3) Forms required to be accompanied with delivery shall be in accordance with Section 217.09 of VDOT *Road and Bridge Specifications*.
- 4) See Part 3 - EXECUTION of these specifications for handling of materials during placement of hydraulic cement concrete.

B. Steel Handling/Examination**1) Steel Reinforcing Storage:**

Reinforcing steel shall be stored on platforms, skids, or other supports that will keep the steel above ground, well drained, and protected against deformation. Upon deliver to site, epoxy coated steel shall be covered with an opaque covering. Coverings shall be placed to provide air circulation and prevent condensation.

2) Steel Reinforcing Inspection

a. **Plain Steel Reinforcing:** The Contractor shall be responsible for inspecting materials thoroughly upon arrival. Examine materials for damage or excessive rust. Remove damaged or rejected materials from site. A light coat of rust is permitted to develop on steel bars and fabric; however, rust scaling and flaking is not permitted.

b. **Coated Steel Reinforcing:** Handling and storage of coated bars shall conform to the requirements of AASHTO M284. Visible damage to the coating shall be patched or repaired with materials compatible to the existing coating in accordance with AASHTO M284.

3) **Pre-Installation Inspection:** Prior to being installed, inspect each bar of steel reinforcing for the presence of dirt, paint, oil, rust scaling, flaking or other foreign matter. Remove such matter with appropriate methods and to the satisfaction of the City Engineer.

C. Observe manufacturer's directions for delivery and storage of materials and accessories.

D. Hydraulic cement concrete plant shall be certified by Virginia Department of Transportation.

1.8 PROJECT CONDITIONS**1.8.1 PROTECTION OF STREAMS**

Do not discharge excess concrete into a drainage pipe, catchbasin, ditch, stream, river, pond, lake, or on City property without the approval of the City Construction Engineer.

1.8.2 PROTECTION OF ROADWAYS

Do not discharge or allow concrete to spill onto any roadway or appurtenances either during placement or while in transit. Remove spills immediately or otherwise repair street as directed by the City Engineer. The contractor shall be responsible for cleanup of all waste/excess of concrete.

1.8.3 PROTECTION OF PROPERTY

Do not discharge excess concrete without written permission of the property owner.

1.9 COORDINATION

Coordinate placement of sidewalk and driveway connections to municipal streets and roadways with the City Engineer.

PART 2 – PRODUCTS

2.1 HYDRAULIC CEMENT CONCRETE

Ready mixed concrete shall comply with ASTM C94, *Standard Specification for Ready-Mixed Concrete*. Cement concrete shall meet the requirements of Section 217, *VDOT Road and Bridge Specifications* or latest revision. Concrete strength shall be as specified on Standard Details and drawings. Concrete class for combined curb and gutter, curbs, sidewalks, driveways, flumes, ditches, steps, headwalls, and islands shall be a minimum of A3, 3000 psi or as designated in the specifications or drawings. Unless otherwise specified, all concrete shall be Class A3, minimum.

All exposed concrete shall be air entrained with an air content conforming to the requirements of Table II-17, Section 217 of the *VDOT Road and Bridge Specifications*, latest revision. Air entrained admixtures for use in portland cement concrete shall meet the requirements of AASHTO designation M154. Only those admixtures shall be used which have been approved by the City Engineer.

Calcium chloride may be used as an admixture if approved by the City Engineer. Calcium chloride shall conform to AASHTO M144, type 2. The use of calcium chloride is not permitted in reinforced concrete construction.

Concrete admixtures, when specified, shall conform to Section 215 of *VDOT Road and Bridge Specifications*.

Concrete Classes (VDOT) to Design Compressive Strength at 28 days (f'c):

Class A4.5	General	4,500-psi
Class A4	General	4,000-psi
Class A3	General	3,000-psi
Class B2	Massive or Lightly Reinforced	2,200-psi

2.2 MISCELLANEOUS

2.2.1 HANDRAILS

Handrails shall conform to requirements of Section 410 of the *VDOT Road and Bridge Specifications*.

2.2.2 ASPHALT EXPANSION JOINT FILLER

Asphalt expansion joint filler material shall be in accordance with Section 212.02(c) of the *VDOT Road and Bridge Specifications*, latest revision. Material shall be approximately ½ inch in thickness and a width and depth equal to those of the incidental structure.

2.2.3 CURING MATERIALS

White pigmented liquid membrane curing compound, PE film, or water for curing shall meet the requirements of Section 220 of the VDOT *Road and Bridge Specifications*.

2.2.4 INSULATION BLANKET

In cold weather operations, insulated blankets must retain or supply moisture and maintain the temperature at the outermost surfaces of concrete above 50° F for at least 72 hours and above 32° F for at least an additional 48 hours.

2.2.5 POROUS BACKFILL AND WEEP HOLES

Porous backfill material and drain pipes for weep holes for retaining walls shall conform to requirements of Section 506 of the VDOT *Road and Bridge Specifications*.

2.2.6 PORTLAND CEMENT

Type I, CSA normal, ASTM C150 *Standard Specification for Portland Cement*.

2.2.7 REINFORCEMENT

A. Reinforcing Bars

Reinforcing bars shall conform to the requirements Section 223, Grade 40 or 60 of the VDOT *Road and Bridge Specifications*, latest revision.

B. Welded Wire Fabric

Wire mesh reinforcement shall be minimum 6 x 6, 10 Ga. shall conform to the requirements of Section 223 of VDOT *Road and Bridge Specifications*, latest revision.

2.2.8 AGGREGATE BASE MATERIAL

Aggregate base materials for foundation support shall be VDOT 21A, compacted, and in compliance with Section 208 of the VDOT *Road and Bridge Specifications*, latest revision.

PART 3 – EXECUTION

3.1 CONSTRUCTION – ALL CONCRETE ITEMS

3.1.1 CONSTRUCTION OF SUBGRADE

- A. **Subgrade Preparation:** Excavation and subgrade preparation shall be in strict compliance with Section 02200, *Earthwork*. The subgrade upon which this work is to be placed shall be shaped and compacted to a firm, even surface conforming to the elevation and cross-sections shown on the plans, the Standard Details or as directed by the Engineer. All soft, frozen, and unsuitable material shall be removed and replaced with approved material. The subgrade shall be moist when the concrete is placed.
- B. **Subgrade Fine Grading (Trimming):** When forms have been set to exact grade and secured, fine grading to exact sub-grade elevation shall be completed by hand. Before pouring operations begin, the Contractor shall have forms set and grade tested and approved by the Construction Coordinator ahead of pouring operations. Subgrade fine grading shall be the responsibility of the Contractor to insure that the subgrade conforms to the Standard Details.

3.1.2 FORMS

Forms for this work shall be of wood, metal, or other approved material, shall extend to the full depth of the concrete and shall be straight, free from warps and of sufficient strength to withstand the pressure of the concrete without springing. Bracing and staking of the forms shall be such that the forms will remain in both horizontal and vertical alignment until their removal. Forms shall be cleaned of foreign matter and oiled before concrete is placed. No concrete shall be poured into forms that have not been checked and approved by the City Construction Coordinator.

3.1.3 CURING

A. Curing – Year Round

The following method of curing is required year round:

- 1) **Liquid Membrane Compound:** Apply membrane-curing compound for curing, sealing, and moisture retention. The entire surface of the concrete shall be sprayed uniformly with a white pigmented membrane-forming compound immediately following the texturing operation.

Perform application in accordance with manufacturer's directions but at a minimum rate of 100 to 150 square feet per gallon and not more than 350 square feet per gallon. Application shall be by a sprayer or long-nap roller and shall be an even, continuous membrane produced on the concrete surface. No puddling shall be produced. At the time of use, the compound shall be in a thoroughly mixed condition, with pigment uniformly dispersed through the vehicle.

The membrane shall harden 30 minutes after application. Personnel and equipment shall be kept off the freshly applied material to prevent damage to the seal for a minimum of 72 hours. If the membrane becomes damaged within the initial 72 hours, damaged portions shall be repaired immediately with additional compound. Other requirements for protection of the structural integrity of concrete from pedestrians, vehicular traffic, and equipment shall be per these specifications as stated in applicable sections.

If removal of forms is required, exposed sections shall be protected immediately to provide a curing treatment equal to that provided for the surface.

- 2) **PE Film:** Concrete shall be covered with PE film. Color of film shall be white. However, from November 1 to April 1, clear or opaque PE film will be permitted. Film shall be installed immediately after liquid membrane compound has obtained a sufficient set so that it is not damaged. Apply film so that marks from application are not produced.
- 3) No extra compensation will be made for curing of any type.

B. Cold Weather Curing – Additional Requirements

No concrete is to be poured when the outside ambient temperature is 40 degrees and falling. Cold weather curing shall be applied when the outside temperature is 50 degrees and falling.

- 1) **Concrete Temperature:** Conform to the requirements of paragraph 217.10 *Placement Limitation* of the *VDOT Road and Bridge Specifications*, latest revision for the required temperatures of concrete.
- 2) **Cold Subgrade:** No concrete is to be placed on a frozen subgrade.
- 3) In addition to year round curing, install insulated blankets that will retain or supply moisture and maintain the temperature of concrete at the outermost surfaces above 50° F for at least 72 hours and above 32° F for at least an additional 48 hours. Blankets shall be left in place for a minimum of 7 days.
- 4) In cold weather applications, calcium chloride may be used as an admixture, if approved by the City Engineer

C. Hot Weather Curing – Additional Requirements

Hot weather curing shall be applied when the outside temperature is 75 degrees and rising. Care shall be taken in hot, dry, or windy weather to protect the concrete from shrinkage cracking by applying at a minimum, liquid membrane compound and PE film as described in Section 3.1.3 A, above.

Routine hot weather measures shall include cooling forms and wetting subgrade in addition to any other measures as required by the City Engineer.

Other measures for curing may be required by the City Engineer, such as: fog spraying, sprinkling, ponding, windbreaks, shading, or wet covering with an approved light colored material.

Hot weather curing shall remain in place for a minimum of 7 days.

D. Improper Curing

Any work damaged due to improper curing, freezing, or rain, shall be replaced at the Contractor's expense.

3.1.4 PROTECTION OF CONCRETE

- A. Protect new concrete sidewalks and appurtenances from pedestrian traffic for a minimum of 24 hours and driveway surfaces and curb and gutter from vehicular traffic for minimum of 7 days, unless otherwise approved by the City Engineer. Erect and maintain warning signs, lights, and watchmen to protect pedestrians and to direct traffic as needed.
- B. No equipment shall be driven or moved across newly concreted surfaces unless such equipment is rubber-tired and only if concrete surface is designed for and capable of sustaining loads imposed by the equipment.
- C. Protect new concrete from graffiti.
- D. Protection of concrete shall meet requirements of Section 404.03 of the VDOT *Road and Bridge Specifications*, latest revision.

3.1.5 TESTING

Testing shall be in accordance with the requirements of Section 217.08 – *Acceptance* of the VDOT *Road and Bridge Specifications*, latest revision.

3.1.6 COORDINATION OF POURS

It will be the responsibility of the Contractor to coordinate the times of pours with the City Construction Coordinator. For miscellaneous concrete pours (i.e. sidewalk, curb & gutter, collars, etc), a minimum of 24 hours notice shall be given to the City Construction Coordinator so that he/she can check all aspects of the work before the pouring operations begin. For structural pours (i.e. retaining walls, bridge decks, box culverts, etc.), a minimum of 48 hours notice shall be given to the City Construction Coordinator. Under no circumstances shall the Contractor pour concrete until the Construction Coordinator has had time to make checks of the work.

3.1.7 PLACING AND FINISHING – ALL CONCRETE ITEMS

The concrete shall be placed in the forms in such a manner as to prevent the segregation of the mortar and the aggregate. The concrete shall be spaded, tamped, or vibrated sufficiently to bring the mortar to the surface.

Prior to and during pouring operations, the Contractor's foreman or formsetter shall carefully watch all alignment and grades to detect any errors in grade or misalignment. In the event any of the work is damaged from any cause or proves defective in any way, or is out of alignment or grade, the Contractor shall remove such work and replace at his own expense. The detection of poor subgrade shall also be his responsibility.

When sufficient concrete has been placed in the forms, it shall be well spaded along all areas in contact with the forms in order to eliminate all honeycombing. Concrete shall be floated to the proper grade and alignment, free from depressions or other irregularities, after which the exposed surfaces shall then be screeded with a straight edge and finished with a steel or wooden trowel.

The concrete shall be troweled smooth and, before the concrete obtains full set, very lightly brushed with a brush moistened with clear water. No mortar shall be used in the finishing. Immediately following finishing operations, the finished concrete shall be cured and protected in accordance with these specifications.

3.1.8 DEFECTIVE WORK

The City will require the removal and replacement of any concrete items where they have been broken, cracked, chipped, have become misaligned, grades are incorrect, does not meet dimensions as shown in the Standard Details, improperly cured, or of a substandard or non-approved product. Such areas designated by the City Engineer shall be replaced at no cost to the City. Items replaced shall conform to the requirements for new work as to strength and construction. During removal of defective work, an amount equal to the required lengths of construction joints for each item or the amount as directed by the City Engineer must be removed and replaced.

The Engineer may drill cores from the completed slab to make depth measurements. Sections showing a deficiency of more than 3/8 inch shall be removed and replaced to the specified depth at the Contractor's expense.

3.1.9 PLACEMENT LIMITATIONS

Conform to the requirements of paragraph 217.10 of the VDOT *Road and Bridge Specifications*, latest revision for concrete temperature.

3.1.10 REINFORCING STEEL OR WIRE MESH

Wire mesh or reinforcing steel will be used if recommended by the City Engineer, stated in the specifications, shown on plans, or Standard Details. For installation of mesh or steel, see the applicable Sections of the VDOT *Road and Bridge Specifications or Standards*. All wire mesh or steel shall be properly spaced and thoroughly tied, and approved by the City Construction Coordinator before concrete is placed.

3.2 STANDARD CONCRETE CURB AND COMBINED CURB AND GUTTER

3.2.1 GENERAL REQUIREMENTS – COMBINED CURB & GUTTER

This work shall consist of a single course of portland cement concrete, constructed on a prepared subgrade in accordance with these specifications. It shall have the dimensions, cross-section, and location as shown on the plans or as directed by the City Engineer. See **Standard Detail 25.04** for standard concrete curb, combined curb and gutter, and valley gutter sections.

Horizontal alignment of curbs and combined curb and gutter shall be in reasonably close conformity to the lines shown on the plans. Vertical alignment shall not exceed +/- 3/8 inch in 10 feet from plan grade.

Before concrete obtains full set, all exposed surfaces shall be finished with a brush moistened with clear water.

When constructing curb and gutter, the Contractor will be responsible for filling and compacting material in the space left behind the curb and gutter after the forms are removed. This shall take place within 3 to 7 days from pour and the material shall be compacted to the grade of the back of the curb. No extra compensation shall be made for this work.

When tying curb and gutter into inlets, dowels shall be placed in the throat plate, to tie gutter to plate as required in the use of conventional forms.

3.2.2 JOINTS FOR CURB AND GUTTER

A. Transverse Joints

- 1) Transverse joints for crack control for fixed forms shall be provided at the following locations:
 - a. At approximately 10 foot intervals;
 - b. At the gutter where the curb and gutter ties to the gutter apron of drop inlets;
 - c. When time elapsing between consecutive concrete placements exceeds 45 minutes; and
 - d. Where no section shall be less than 6 feet in length.
- 2) Transverse joints for crack control may be formed by using one of the following methods:
 - a. Removable 1/8 inch thick templates;
 - b. Scoring or sawing for a depth of not less than 3/4 inch when using curb machine; or

- c. Approved “leave-in” type insert or may be formed or created using other approved methods which will successfully induce and control the location and shape of the transverse cracks. Approval by the City Engineer is required.

If templates are used for transverse joints, templates shall be removed by stages, but not entirely until the concrete has become thoroughly hard. After removal of the templates, there must be a clear division throughout between these sections. Edging tools will be used to form an edge along the back and front form and at each template.

- B. **Expansion Joints:** See PRODUCTS, section 2.2.3 of these specifications for approved expansion materials.

Expansion joints shall be formed at intervals of approximately 90 feet, at all radii points at concrete entrances and curb returns, at locations no less than 6 feet and no more than 10 feet from drop inlets, at the end of days work, and or all cold joints.

3.2.3 FORMS – COMBINED CURB & GUTTER

A. Fixed Forms

Fixed forms shall be straight, free from warp, and of such construction that there will be no interference with the inspection of grade and alignment. Forms shall extend the entire depth of the item and shall be braced and secured so that no deflection from alignment or grade will occur during concrete placement. Radial forms shall be sufficiently flexible or otherwise designed to provide a smooth, uniform, curved surface of the required radius. When sufficient concrete has been placed in the forms, it shall be well spaded along all areas in contact with the forms in order to eliminate all honeycombing. Face forms shall be removed as soon as concrete has attained sufficient set for the curb to stand without slumping. The exposed surface shall then be smoothed by the use of a suitable finishing tool.

B. Slip Forms

The contractor will be permitted to slipform combined curb & gutter provided that he has obtained approval by the City Engineer and that all slipform requirements stated in the VDOT, *Road and Bridge Specifications*, Section 502.03 (b), or latest revision are adhered to.

3.3 STANDARD PORTLAND CEMENT CONCRETE SIDEWALK AND DRIVEWAY ENTRANCES

3.3.1 GENERAL REQUIREMENTS

This work shall consist of the construction of portland cement concrete sidewalk 4 inches thick and in accordance with these specifications. Sidewalks crossing driveways entrances and the driveway entrances shall be constructed 7 inches thick. See **Standard Details 25.05** and **25.06** for sidewalk and **Standard Details 25.10**, **25.11**, and **25.12** for driveway entrance openings.

Curb cuts for driveways and handicap ramps shall be constructed as shown on the Standard Details for the type driveway or ramp specified on the plans or as directed by the City Engineer.

Handicap ramps shall be constructed at all street intersection corners. The ramps shall be constructed as shown on the Standard Details for the type shown on the plans or as directed by the City Engineer.

Sidewalks shall not be opened to pedestrian traffic for the first 24 hours. Vehicular traffic shall be excluded for the first 7 days or until the minimum design compressive strength is attained, whichever is the lesser time.

Tolerances: Horizontal alignment of sidewalks shall be to the lines and grades as shown on the plans and details. Vertical alignment shall not exceed +/- 3/8 inch in 10 feet from the plan grade.

3.3.2 JOINTS FOR CONCRETE SIDEWALK AND DRIVEWAY ENTRANCES

Transverse expansion joints shall be constructed at intervals of approximately 30 feet. Slabs shall be separated by transverse preformed joint filler, 1/2 inch in thickness, that extends from the bottom of the slab to approximately 1/4 inch below the top surface.

The slab between expansion joints shall be divided into sections approximately 5 feet in length by transverse score joints formed by a jointing tool, trowel, or other approved means. Transverse control joints shall also be provided when the time period between consecutive concrete placements is more than 45 minutes. Control joints shall extend into concrete for at least 1/4 of the depth and shall be approximately 1/8 inch in width. Where slabs are more than 7 feet in width, control joints shall be formed longitudinally to obtain secure uniform blocks that are approximately square. Transverse control joints shall also be installed where the corners of the drop inlets project into the sidewalk.

Construction joints shall be formed around appurtenances extending into and through the sidewalk. Preformed joint filler 1/4-inch thick shall be installed in these joints except that joint filler shall not be used adjacent to drop inlets. Preformed joint filler shall be securely fastened. An expansion joint shall be formed and filled with 1/4 inch preformed joint filler no less than 6 feet and no more than 10 feet from drop inlets. Preformed joint filler shall also be installed between concrete sidewalk and any adjacent fixed structure which is not tied to the sidewalk with steel dowels.

3.3.3 PLACING AND FINISHING CONCRETE

The foundation shall be thoroughly moistened immediately prior to concrete placement. Concrete shall be placed in forms by methods that will prevent segregation. Concrete shall be spread to the full depth and brought to grade by screeding and straightedging. Concrete shall be spaded adjacent to forms to prevent a honeycomb appearance, and the surface shall be floated with a wooden float to produce a surface free from irregularities. The final finish shall be obtained with an approved hand float that will produce a uniform surface texture. Light brooming shall be used to hide trowel marks. Outside edges of the sidewalk slab and joints shall be edged with an edging tool having a radius of 1/4 inch.

See paragraph 3.1.3 *Curing* for requirements for curing concrete.

3.3.4 FORMS

A. Fixed Forms

See paragraph 3.2.3 A *Fixed Forms*, of these specifications.

B. Slip Forms

Slip form pouring shall be allowed with approval of the City Engineer. All portions of paragraph 3.2.3 B, *Slip Forms*, of these specifications, concerning pouring operations with slip forms shall apply.

3.4 FACEDOWN PORTLAND CEMENT CONCRETE SIDEWALK

This type of sidewalk construction shall consist of standard sidewalk as specified in above paragraph 3.3 - *Standard Portland Cement Concrete Sidewalk and Driveway Entrances*, of these specifications, poured monolithically with a 12-inch curb as shown on **Standard Detail 25.06**. See also **Standard Details 25.10, 25.11, and 25.12** for driveway entrance openings.

The methods of construction for facedown sidewalk shall be the same specified in paragraph 3.3 - *Standard Portland Cement Concrete Sidewalk and Driveway Entrances* of these specifications with the following additions:

- A. A joint shall be cut with an approved edging tool 6 inches from the face of the curb and parallel thereto.
- B. All expansion joints in the sidewalk shall extend across the top and face of the curb.
- C. The final finish for the top of the curb shall be made with a brush dampened with water, to match the finish of the adjoining structure.

3.5 MISCELLANEOUS PORTLAND CEMENT CONCRETE STRUCTURES AND APPURTANCES

This work shall consist of portland cement concrete retaining walls, headwalls, steps, piers for stream crossings, flumes and ditches, median barriers, median strips, islands, etc. constructed in accordance with these specifications. Any specifications or details pertaining to these items that are not covered herein shall be per VDOT *Road and Bridge Specifications and Standards*, latest revision. These structures shall be constructed to the dimensions, cross-sections, and locations as shown on the plans, shown on the Standard Details, or as directed by the City Engineer.

END OF SECTION 02400

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02500 – BASE COURSE AND PAVING

(Revised 10/25/04)

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[PART 1 – GENERAL](#)

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this specification.
- B. Section 01000 – GENERAL REQUIREMENTS.
- C. [Section 02200](#) – EARTHWORK.
- D. [Section 02220](#) – TRENCHING, BACKFILLING AND COMPACTION OF UTILITIES.
- E. [Section 02400](#) – CURB & GUTTER, DRIVEWAYS AND SIDEWALKS.
- F. Any Specifications or details not covered herein shall be per Virginia Department of Transportation, *Road and Bridge Specifications*, 2002 or latest revision.

1.2 SUMMARY

This section includes all equipment, labor, material, and services required for complete installation of aggregate base courses and asphalt concrete pavement structures and specialties for municipal street systems.

1.3 DEFINITIONS

For the purposes of this specification, the following definitions refer to roadway and street systems that come under the authority of the City of Lynchburg, Virginia as specified within this section and other sections of this manual.

- A. **Aggregate Base Course:** A layer of material of a specified thickness placed between the subbase and asphalt paving.
- B. **Base Course:** A layer of material of a specified thickness placed between the subbase or aggregate base course and the intermediate or surface course.

- C. **Public Road System:** Roadway, streets, and their appurtenances required for the conveyance of the motoring public that are maintained by either the City of Lynchburg or the Virginia Department of Transportation.
- D. **Subbase Course:** A layer of material of a specified thickness that is placed on a subgrade to support a base course.
- E. **Subgrade:** The top surface of a roadbed shaped to conform to the typical section on which the pavement structure and shoulders are constructed.
- F. **Subgrade Stabilization:** The modification of roadbed soils by admixing with stabilizing or chemical agents that will increase the load bearing capacity, firmness, and resistance to weathering or displacement.
- G. **Suitable Subgrade:** A subgrade that consists of a material type and density that is approved by the City Engineer for placing a subsequent layer of material.
- H. **Surface Course/Wearing Surface:** The top layer of a pavement structure that resists skidding, traffic abrasion, and disintegrating effects of weather.

1.4 SUBMITTALS

- A. Submit job-mix formula for each mixture to be supplied within 30 days after contract is awarded.
- B. Submit product data and shop drawings for manhole, lampstack, and valve box adjustment rings in accordance with Section 01000, *General Requirements*.

1.5 QUALITY ASSURANCE

- A. Asphalt concrete pavement thickness and density shall conform to the requirements of Section 315 of VDOT *Road and Bridge Specifications*, or latest revision. Asphalt concrete pavement coring sample thickness and density test reports shall be submitted at completion of project in accordance with the requirements of Section 315 of VDOT *Road and Bridge Specifications*, or latest revision.
- B. Aggregate base course density shall conform to the requirements of Section 308 and 309 of VDOT *Road and Bridge Specifications*, or latest revision.
- C. Materials and operations shall comply with the latest revision of all applicable codes and standards.

1.6 STANDARD ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
ANSI	American National Standards Institute
AREA	American Railway Engineers Association

ASTM	American Society for Testing and Materials
BM	Base Mix
FS	Federal Specifications
HMA	Hot Mix Asphalt
IM	Intermediate Mix
MSDS	Material Safety Data Sheets
OSHA	Occupational Safety and Health Administration
RAP	Recycled Asphalt Pavement
SM	Surface Mix
VDOT	Virginia Department of Transportation

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Plant operations shall be in accordance with Section 211 *Asphalt Concrete* of the VDOT *Road and Bridge Specifications*, latest revision.
- B. Shipping and storing shall be in accordance with Section 210 *Asphalt Materials* of the VDOT *Road and Bridge Specifications*, latest revision.
- C. Hauling equipment shall be in accordance with Section 315.03 *Equipment* of the VDOT *Road and Bridge Specifications*, latest revision.
- D. **Delivery**
 - 1) Hauling equipment shall be loaded in a manner to minimize segregation of the mix.
 - 2) Haul trucks shall park in a designated area to minimize tracking of tack coats.
 - 3) Once loaded, haul trucks shall proceed immediately to the job site.

1.8 PROJECT CONDITIONS

1.8.1 PROTECTION OF STREAMS

Do not discharge excess concrete into a drainage pipe, catchbasin, ditch, stream, river, pond, lake, or on City property without the approval of the City Construction Engineer.

1.8.2 PROTECTION OF ROADWAYS

Do not discharge or allow concrete to spill onto any roadway or appurtenances either during placement or while in transit. Remove spills immediately or otherwise repair street as directed by the City Engineer. The contractor shall be responsible for cleanup of all waste/excess of concrete.

1.8.3 PROTECTION OF PROPERTY

Do not discharge excess concrete without written permission of the property owner.

1.9 COORDINATION

- A. Coordinate manhole, lampstack, and valve box adjusting with the City of Lynchburg, City Engineer.
- B. Coordinate tie-in to municipal roadways with the City of Lynchburg, City Engineer.

PART 2 – PRODUCTS

2.1 AGGREGATE BASE COURSE

Aggregate base material shall be designated as Type 1 size 21A or 21B in accordance with Section 208 *Subbase and Aggregate Base Material* of the VDOT *Road and Bridge Specifications*, latest revision.

2.2 HYDRAULIC CEMENT STABILIZATION

Hydraulic cement stabilization shall be in accordance with Section 307 *Hydraulic Cement Stabilization* of the VDOT *Road and Bridge Specifications*, latest revision.

2.3 ASPHALT CONCRETE PAVEMENTS

Asphalt concrete pavements shall be in accordance with Section 211 *Asphalt Concrete Materials* of the VDOT *Road and Bridge Specifications*, latest revision.

The use of reclaimed asphalt pavement shall be in accordance with Section 211 *Asphalt Concrete Materials* of the VDOT *Road and Bridge Specifications*, latest revision.

The use of aggregate from Blue Ridge Stone Corporation, Lawyers Road Plant, Lynchburg, Virginia will be restricted from use in asphalt surface courses where the ADT exceeds 14,999 vehicles per day.

2.4 TACK COAT

Tack coat shall be in accordance with Section 310 *Tack Coat* of the VDOT *Road and Bridge Specifications*, latest revision.

2.5 ASPHALT SEAL COAT

Asphalt seal coat shall be in accordance with Section 312 *Seal Coat* of the *VDOT Road and Bridge Specifications*, latest revision.

2.6 EMULSIFIED ASPHALT SLURRY SEAL SURFACES

Emulsified asphalt slurry seal surfaces shall be in accordance with *VDOT Special Provision for Emulsified Asphalt Slurry Seal* dated October 14, 1994 or latest revision.

2.7 PAVEMENT REINFORCING FABRIC

Pavement reinforcing fabric shall be A/oMat C040 or equal and meet or exceed AASHTO M288-00, Paving Fabric requirements and conform under AASHTO National Transportation Product Evaluation program. The fabric is needle punched, non-woven and heat treated on one side. This fabric shall conform to the following:

Physical Properties			
Fabric Property	Test Method	Units	C040
Weight	ASTM D 3776	oz/yd ²	≥4.2 (142gm/m ²)
Grab tensile elongation	ASTM D 4632	Lbs.	102 (453N)
Grab elongation	ASTM D 4632	%	50
Trap tear	ASTM D 4533	Lbs.	45(.220 kN)
Puncture	ASTM D 4833	Lbs.	60 (.267kN)
Mullen burst	ASTM D 3786	psi	200(1378 kPa)
Asphalt retention	ASTM D 6140	Gal/yd ²	0.23 (1.04l/m ²)
Melting point	ASTM D 276	Degrees F	325 F (163 C)
Thickness	ASTM D 1777	Mils	30
Ultraviolet Degradation	ASTM D 4355	%Strength Retained @ 150 Hrs	70%

PART 3 – EXECUTION

3.1 GENERAL

Construction and testing shall conform to these specifications and standard drawings as well as any specifications or details not covered herein shall be per the applicable sections of Divisions I, II, III, V, and VII of the *Virginia Department of Transportation Road and Bridge Specifications*, latest revision and on the Standard Details shown in the *VDOT Road and Bridge Standards*, latest revision.

3.2 PAVEMENT, PATCHES, REPAIR AND REPLACEMENT (PERMANENT & TEMPORARY)

- A. **General:** This work shall consist of replacing subbase stone, and asphalt material in the street in areas where it becomes necessary to remove the original pavement such as for roadway failures, sewer trenches, water main trenches, drainage pipe ditches, etc. Pavement repair depths shall be the type to match the existing street pavement as shown on the drawings or as determined by the City Engineer.

- B. **Cutting Pavement:** For all areas that are patched, the edges of the pavement shall be cut in a straight line revealing a vertical face for the patch to abut against. Care shall be taken during excavation and construction to avoid damage to adjoining paved surfaces. If patching is performed as part of piping installations, perform cutting operations prior to installation of line to avoid excessive removal of pavement.
- C. **Surface Tolerances:** The asphalt patched surface shall be tested using a 10-foot straightedge. The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall not exceed $\frac{1}{4}$ -inch allowing for the contours of the existing pavement. All humps or depressions exceeding the specified tolerance shall be corrected or the defective work removed and replaced with new material. Any deviation from this standard will be at the discretion of the City Engineer.
- D. **Excavation:** Excavation of the existing pavement and subbase shall be made to a depth as shown on the applicable **Standard Details 25.18 through 25.22**. Before the placement of any stone, concrete or asphalt material, a representative of the City Engineer shall inspect the underlying subgrade. The Contractor shall be responsible for correcting any ruts or soft yielding places to a depth of approved suitable subgrade before placing of the asphalt material. Any depths below 4 inches shall be paid as extra work.

3.2.1 PERMANENT PAVEMENT REPAIR

A. Asphalt Pavement Repair

Aggregate Base Stone: The aggregate base shall be installed in accordance with **Standard Detail 25.18** and compacted to the density specified in *VDOT Road and Bridge Specifications*, Section 309 *Aggregate Base Course*, latest revision.

Asphalt Concrete Pavement: The asphalt concrete pavement shall be installed in accordance with **Standard Detail 25.18**. Compact to the density specified in *VDOT Road and Bridge Specifications*, Section 315 *Asphalt Concrete Pavement*, latest revision.

Lift thickness shall not exceed those as referenced within these specifications. Before placing any asphalt material, all sides of the existing pavement and subbase shall be thoroughly tacked at the rate of 0.3 Gal/SY. The finished surface shall abut the existing pavement with no overlap allowed.

B. Concrete Pavement Repair

Aggregate Base Stone: The aggregate base shall installed in accordance with **Standard Detail 25.19** and compacted to the density specified in *VDOT Road and Bridge Specifications*, Section 309 *Aggregate Base Course*, latest revision.

Hydraulic Cement Concrete Pavement: The concrete pavement shall be installed in accordance with **Standard Detail 25.19** using a minimum 3000 psi concrete at 28 days. The City Engineer reserves the right to require that the Contractor pull concrete test cylinders for verifying concrete strength. Concrete shall meet *VDOT Road and Bridge Specifications*, Section 217 *Hydraulic Cement Concrete* and Section 316, *Hydraulic Cement Pavement*.

C. **Historical District with Asphalt Pavement Overlay or without Asphalt Overlay**

Sand: Four inches of sand shall be placed to the depth shown on **Standard Details 25.21 or 25.22**, as applicable. Sand shall be Unified Soil Classification type SW compacted in accordance with Table 2220.6 of this specification.

Aggregate Base Stone: The aggregate base shall be installed in accordance with **Standard Detail 25.21 or 25.22**, as applicable and compacted to the density specified in *VDOT Road and Bridge Specifications*, Section 309 *Aggregate Base Course*, latest revision.

Belgium Block, Cobble or Brick: The pavers shall be installed in accordance with **Standard Detail 25.21 or 25.22** as applicable. Before placing an asphalt mix over pavers (**Standard Detail 25.21**), fill joints between pavers with like material.

Asphalt Surface Course: **Standard Detail 25.21** specifies a finished surface course of asphalt mix over the pavers. Cut back the existing asphalt pavement as shown on **Standard Detail 25.21**. Care shall be taken to insure a uniform grade between the existing pavement and the new surface.

3.2.2 TEMPORARY PAVEMENT REPAIR

A. **Asphalt Pavement Repair**

When shown on the plans, during winter months when asphalt concrete is unavailable, or when directed by the City Engineer, temporary pavement patches conforming to **Standard Detail 25.20** shall be installed. The Contractor shall maintain the temporary repair to the satisfaction of the City Engineer until the permanent pavement repair is made.

Cold patch material shall be installed in accordance with manufacturer's recommendations.

Density shall conform to the applicable sections referenced above under permanent pavement repair for each particular product (i.e. aggregate base course).

B. Once hot asphalt mix is available, all temporary patch material shall be removed and replaced with a permanent hot asphalt patch within thirty calendar days.

3.3 AGGREGATE BASE COURSE

A. Subgrade Approval

The underlying course upon which the aggregate base course is to be placed shall be prepared in accordance with the requirements of Section 02200, *Earthwork*, of these specifications and applicable sections of VDOT *Road and Bridge Specifications*, Section 304, *Constructing Density Control Strips* and Section 305, *Subgrade and Shoulders*, latest revision. Prior to any spreading operations, the underlying course shall be checked and accepted by the City Engineer. Any ruts or soft yielding places shall be corrected and rolled before the base course is applied.

B. Installation of Aggregate Base Course

The aggregate base course shall be mixed in an approved central mixing plant of the pugmill type and water added during mixing operations in the amount necessary to provide the optimum moisture content for compacting. After mixing, the material shall be transported to the job site and placed on the roadbed by means of an approved aggregate spreader.

The aggregate base course shall be constructed in layers not less than 3 inches or more than 6 inches of compacted thickness. When vibrating with other approved types of special compacting equipment, the compacted depth of a single layer of the aggregate base course may be increased to 8 inches upon approval by the City Engineer. The aggregate, as spread, shall be uniform in gradation with no segregation or pockets of fine or coarse material.

C. Compaction Operations and Density Requirements

After mixing and spreading, the aggregate base course shall be thoroughly compacted at optimum moisture within +/- 20-percent of optimum. Rolling shall progress gradually from the sides to the center and shall continue until the entire area of the course has been rolled by the rear wheels. Rolling shall continue until the material has been compacted to not less than 100 percent density when tested in accordance with AASHTO T191, latest revision.

D. Grading Tolerances of Final Surface

After final rolling, the surface shall be inspected and any irregularities in excess of ½ inch shall be corrected. Aggregate base course shall conform to the lines, grades, and typical cross sections shown on the plans, details or as established by the City Engineer within a tolerance of +/- ½ inch. Any irregularities in the surface shall be corrected by scarifying, remixing, reshaping, and recompacting until a smooth surface is obtained. If directed by the City Engineer, the aggregate base shall be opened to public traffic for at least 2 weeks before being surfaced. During this time, the surface shall be protected against loss of shape, required grades, and material by the addition of moisture and any re-working as necessary. This shall be at no additional cost to the City.

3.4 HYDRAULIC CEMENT STABILIZATION

Placement of hydraulic cement stabilization shall be in accordance with VDOT *Road and Bridge Specifications*, Section 307, latest revision.

3.5 ASPHALT CONCRETE PAVEMENT

3.5.1 CONDITIONING EXISTING SURFACE

Preparation of Surface: Prior to beginning paving operations, the existing areas to be resurfaced shall be thoroughly cleaned by the contractor to the satisfaction of the City Engineer. This cleaning shall include sweeping of the streets with a power operated broom, cutting excess debris with a grader, washing with a water truck, and hand cleaning any debris left after this operation is complete. Cleaning operations shall commence just prior to the resurfacing of streets. In addition, the contractor shall expose any existing paving areas, which have been covered by soil, grass, or debris. These areas shall be thoroughly cleaned and tacked before resurfacing. Any excess material left over after this operation shall be removed or spread out to the satisfaction of the City Engineer. No additional payment shall be made for this work.

When the surface of the existing pavement or base is irregular, it shall be brought to a uniform grade and cross section as directed by the City Engineer. The surface on which the asphalt concrete is to be applied shall be prepared in accordance with the requirements of the applicable specifications.

When specified, prior to placement of asphalt concrete, longitudinal and transverse joints and cracks in hydraulic cement concrete shall be sealed by the application of an approved joint sealing compound.

Any surface casting such as water boxes, manholes, grates, cleanouts, etc. shall be set to grade prior to beginning of paving operation. All telephone manholes and gas boxes are to be adjusted by the utility companies or contractor if approved by the City Engineer. All such castings shall be adjusted within a tolerance of 1/8 inch below or flush with the asphalt finished elevation. See **Standard Details 25.08** and **25.09**. A maximum of three 2-inch riser rings will be allowed for adjusting to grade. Adjustments more than 6 inches above original grade will require excavation and frame adjustment. The contractor shall be required to coat the top of any such casting with a suitable coating material to prevent adhesion of the asphalt material to the casting. A tack coat of asphalt material, conforming to the requirements of these specifications, shall be applied prior to resurfacing operations.

A. Tack Coat

A tack coat of liquid asphalt shall be applied between the existing surface and each asphalt course placed thereafter. The tack coat shall conform to the applicable requirements of VDOT *Road and Bridge Specifications* Section 310.

Tack material shall be uniformly applied with a pressure distributor conforming to VDOT requirements. Hand spray equipment shall not be used except in areas inaccessible by a pressure distributor. Undiluted asphalt shall be applied at a rate of 0.05 to 0.10 gallons per square yard. Diluted asphalt shall be applied at a rate of 0.10 to 0.15 gallons per square yard. The time interval between applying the tack coat and placing the paving mixture shall be sufficient to ensure a tacky residue providing maximum adhesion of the paving mixture to the base. On rich sections or those that have been repaired by the extensive use of asphalt patching mixtures, the tack coat shall be eliminated only if approved by the City Engineer.

Application of tack at joints, adjacent to curbs, gutters, or other appurtenances shall be applied with a hand wand at the rate of 0.20 gallons per square yard. At joints, the hand wand applied tack shall be 2 feet in width with 4 to 6 inches protruding beyond the joint for the first pass. Tack for the adjacent pass shall completely cover the vertical face of the mat edge, so that slight puddling of asphalt occurs at the joint, and extends a minimum of 1 foot into the lane to be paved. Milled faces that are to remain in place shall be tacked as above for the adjacent pass. Use of tack at longitudinal joint vertical faces will not be required when paving in echelon. Care shall be taken to prevent spattering of adjacent pavement, structures, trees, and private property. Any spattering shall be cleaned up by the contractor at no cost to the City.

Tack shall be applied in such a manner as to offer the least inconvenience to traffic and to permit a minimum of one way traffic without pickup or tracking. Traffic shall be excluded from the any pavement that has received tack. New asphalt shall not be placed on tack or prime coats that have been damaged by traffic or contaminated by foreign material.

B. Removing Depressions/Irregularities

Where irregularities in the existing surface would result in a course more than 3 inches in thickness after compaction, the surface shall be brought to a uniform grade by scratching with a thin layer of asphalt concrete not exceeding the minimum thickness as recommended for that type of mix. Then the material shall be thoroughly compacted until it conforms to the surrounding surface. The mixture used shall be the same as that specified for the surface mix to be placed.

3.5.2 PAVEMENT PROFILING

The work included in this item shall consist of the removal of existing asphalt surfaces of in place pavements on various streets within the City of Lynchburg, to produce the desired profile, cross-section, and surface conditions as specified by the City Engineer. All removed material shall become the property of the Contractor.

The contractor shall plan and prosecute a schedule of operations so that milled roadways will be overlaid with asphalt concrete asphalt as soon as possible, and, in no instance, shall the time lapse exceed 7 days after the milling operations, unless otherwise specified. The milled areas of the roadway shall be kept free of irregularities and obstructions that may create a hazard or annoyance to traffic in accordance with the requirements of VDOT *Road and Bridge Specifications* Section 104, latest revision.

The Contractor shall plan and prosecute the milling operation to avoid trapping of water on the roadway. At the discretion of the City Engineer, cutting drainage slots in roadway shoulders or inlets may be required, at no additional cost. The Contractor shall also restore the cut drainage slots afterwards, at no additional cost.

Where asphalt pavement extends into the existing curb and gutter, the contractor shall be required to plane at different slopes. The first cuts shall remove the material existing above the gutter line. These cuts shall be made at the appropriate gutter slope ($1/2":1'$) for 2-foot curb and gutter and ($1":1'$) for 2.5-foot curb and gutter. Any curb and gutter with a different slope shall be planed at the existing curb and gutter slope. The last cuts shall remove the material to a depth of 1 inch below the gutter line with a street cross-section slope of $1/4":1'$ or to slope of existing street.

Where curb and gutter exists but the pavement is at or below the existing gutter line, the pavement shall be cut to a depth of the thickness of overlay below the gutter line while adjusting street cross-section to $1/4":1'$ toward the centerline of the street.

Where existing straight curbing has pavement built up to expose less than 6 inches of curbing, the pavement shall be planed down on grade of $1/4":1'$ or whatever the existing grade of the street back to the street centerline until a desired height of curbing is exposed.

Where center of pavement has correct crown but pavement has rutting or ripples (possibly caused by vehicular braking), the pavement shall be planed to the depth necessary to remove all such defects.

Additional Procedures shall be in accordance with the requirements of VDOT *Road and Bridge Specifications* Section 515, latest revision.

3.5.3 PAVING OPERATIONS

A. Asphalt Concrete Pavement Equipment

Bituminous concrete pavement equipment shall be in accordance with Section 315.03 of the VDOT *Road and Bridge Specifications*, latest revision.

B. Placing and Furnishing

Asphalt concrete asphalt shall not be placed until the surface upon which it is to be placed has been approved by the City Engineer.

The edge of the pavement shall be marked by means of a continuous line placed and maintained a sufficient distance ahead of the paving operation to provide proper control of the pavement width and horizontal alignment.

An asphalt paver shall be used to distribute the asphalt mix over the widest pavement width practicable. Wherever practicable and when the capacity of sustained production and delivery is such that more than one paver can be operated, pavers shall be used in echelon to place the wearing course in adjacent lanes. Crossovers, as well as areas containing manholes or other obstacles that prohibit the practical use of mechanical spreading and finishing equipment, may be constructed using hand tools. However, care shall be taken to obtain the required thickness, jointing, compaction, and surface smoothness.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6 inches. However, the joint in the wearing surface shall be at the centerline of the pavement if the roadway comprises two traffic lanes or at lane lines if the roadway is more than two lanes in width. Offsetting layers will not be required when adjoining lanes are paved in echelon and the rolling of both lanes occurs within 15 minutes after laydown.

The contractor shall have a certified Asphalt Concrete Paving Technician present during paving operations. Immediately after placement and screeding, the surface and edges of each layer shall be inspected and straightedged by the technician and necessary corrections performed prior to compaction. The finished pavement shall be uniform and smooth.

The placement of asphalt concrete shall be as continuous as possible and shall be scheduled such that the interruption occurring at the completion of each day's work will not detrimentally affect the partially completed work. Material that cannot be spread and finished in daylight shall not be dispatched from the plant unless the use of artificial lighting has been approved. When paving is performed at night, sufficient light shall be provided to properly perform and thoroughly inspect every phase of the operation. Such phases include cleaning planed surfaces, tack application, paving, compacting, and testing. Lighting shall be provided and positioned such as to not create a blinding hazard to the traveling public.

During paving operations, the Contractor shall be responsible for furnishing and erecting temporary "no parking" signs on each street that is to be paved. The signs shall be erected at least 24 hours prior to paving operations and on each side of the street as necessary.

C. Layer Thickness

Asphalt concrete SUPERPAVE pavement courses shall be placed in layers not exceeding 4.0 times the nominal maximum size aggregate in the asphalt mixture. The maximum thickness may be reduced if the mixture cannot be adequately placed in a single lift and compacted to required uniform density and smoothness. The minimum thickness for a pavement course shall be no less than 2.5 times the nominal maximum size aggregate in the asphalt mixture. Nominal maximum size aggregate for each mix shall be defined as one sieve size larger than the first sieve to retain more than 10 percent aggregate as shown in the design range specified in Section 211.03, table II-13 of *VDOT Road and Bridge Specifications*, latest revision.

Recommended Thickness Chart	
Mix Type	Minimum Thickness (inches)
SM 9.5	1.5
SM 12.5	2
IM 19.0	2
BM 25.0	4

D. Joints

Care shall be exercised when tying into curb and gutter and newly overlaid travel lanes to ensure a uniform grade and joint.

The contractor shall construct the final riding surface to tie into the existing surface by cutting a notch 1 inch deep by 1 inch wide for all tie-ins to existing pavement, including driveways and ramps. Suitable guidelines or devices shall be used to ensure cutting of the joint on a true line. The joint shall be thoroughly cleaned and dried prior to being sealed. This work shall be done at no additional cost to the City.

Method of temporary joints at the end of each workday shall be approved by the City of Lynchburg City Engineer.

E. Compaction

Immediately after the asphalt mixture is placed and struck off and surface irregularities are corrected, the mixture shall be thoroughly and uniformly compacted by rolling.

During compaction of asphalt concrete asphalt, the roller shall not pass over the end of freshly placed material except when a construction joint is to be formed. Edges shall be finished true and uniform.

The surface shall be rolled when the mixture is in the proper condition. Rolling shall not cause undue displacement, cracking, or shoving.

The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations and the selection of roller types shall provide the specified pavement density.

Immediately after the hot mixture is placed, it shall be sealed with rollers. Thereafter, rolling shall be a continuous process, insofar as practicable, and all parts of the pavement shall receive uniform compaction.

Rolling shall begin at the sides and proceed longitudinally parallel to the center of the pavement, each trip overlapping at least $\frac{1}{2}$ the roller width, gradually progressing to the crown of the pavement. When abutting a previously placed lane, the longitudinal joint shall be rolled first, followed by the regular rolling procedure. On superelevated curves, rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the centerline.

Displacements occurring as a result of reversing the direction of a roller, or from other causes, shall be corrected at once by the use of rakes or lutes and addition of fresh mixture when required. Care shall be taken in rolling not to displace the line and grade of the edges of the asphalt mixture. All roller marks shall be eliminated.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with a very small quantity of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls, and other places not accessible to rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Edges of asphalt pavement surfaces shall be true curves or tangents. Irregularities shall be corrected.

The surface of the compacted course shall be protected until the material has cooled sufficiently to support normal traffic without marring.

F. Density

Density requirements shall be in accordance with Section 315.05 (d) of the *VDOT Road and Bridge Specifications*, latest revision.

G. Pavement Samples

If requested by the City Engineer, the Contractor shall cut samples for testing depth and density. Samples shall be taken for full depth at the locations as selected by the City Engineer. The removed pavement shall be replaced with new mixture and refinished. No additional compensation will be made for such work.

H. Placement Limitations

Placement limitations, to include but not limited to, mixture temperatures, and cold weather paving shall be in accordance with Section 315.04 of the *VDOT Road and Bridge Specifications*, latest revision.

I. Pavement Tolerance

The surface will be tested by using a 10-foot straightedge. The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall not be more than 1/4 inch. Humps and depressions exceeding the specified tolerance shall be corrected, or the defective work shall be removed and replaced with new material.

3.6 PRIME COAT

When a prime coat is required, it shall conform to the applicable requirements of VDOT *Road and Bridge Specifications* Section 311.

When asphalt concrete to be placed has a total thickness of 4 inches or more, priming with liquid asphalt material will not be required on aggregate subbase or base material.

3.7 SEAL COAT

Seal coat shall be in accordance with Section 312, *Seal Coat* of the VDOT *Road and Bridge Specifications*, latest revision.

3.8 EMULSIFIED ASPHALT SLURRY SEAL

Emulsified asphalt slurry seal shall be in accordance with VDOT *Special Provision for Emulsified Asphalt Slurry Seal* dated October 14, 1994, or latest revision.

3.9 PAVEMENT REINFORCING FABRIC

A. Asphalt Distributor

The distributor truck shall be metered and capable of spraying tack coat at a specified uniform application rate. The applicator shall provide uniform coverage without gaps, partial overlaps, or otherwise create heavy streaking. The truck shall be equipped with a hand spray nozzle to distribute tack coat in locations inaccessible by the truck.

B. Fabric Laydown Equipment

The fabric can be installed with a mechanical unit mounted on the front of a tractor or on the back of the distributor truck. Manual units can be used for small jobs. Provide stiff bristle brooms or pneumatic rollers to smooth fabric. Provide all tools such as scissors or blades for cutting fabric. Do not permit traffic directly on fabric.

C. Surface Preparation

Air and pavement temperatures during installation shall be warm enough for the tack coat to remain tacky after placement. Ambient temperatures shall be at least 50°F and rising for bituminous cement tack coat or 60°F and rising for asphalt emulsions.

Clean old pavement of dirt, water, oil, and foreign materials. Fill cracks as directed by the City Engineer, with suitable filler (such as asphalt cement or rubberized asphalt). Repair larger cracks and potholes with a properly compacted hot mix or other similar filler as directed by the City Engineer.

Badly broken pavement is an indication of a failed subgrade and shall be dug out and replaced before overlaying. If the surface is rough but stable, the City Engineer may require milling or placement of a leveling course before installation of the pavement reinforcing fabric. The surface shall be dry prior to tack coat and fabric placement.

D. Application of Tack

The tack coat shall be applied uniformly at the specified rate with calibrated distributor truck. The application temperature shall be high enough to assure uniform distribution (290°F to 325°F for asphalt cements, up to 160°F for heavier grade emulsions). The tack coat shall be applied 2 to 3 inches wider than the edge of the fabric.

Fully saturate the fabric and provide a bond to the overlay without providing excess tack coat that could mix with the overlay of the asphalt. The optimum amount depends on the porosity of the old pavement, fabric weight, tack coat material, and other variables. Typically, 0.2 to 0.3 gal/yd² of pure asphalt cement tack coat is used with the fabric. Emulsion tack coat application rates are greater to provide the same amount of residual asphalt cement. Verify the applications rates with the geotextile manufacturer and coordinate with the City Engineer prior to application.

If asphalt emulsions are used, the water in the emulsion must be allowed to evaporate completely before the fabric is placed. Verify the cure times with the Geotextile manufacturer and coordinate with the City Engineer prior to application.

E. Fabric Placement

Place the fabric on the pavement surface, smooth side up, while the tack coat is still tacky. Drive the vehicle straight to avoid wrinkling. Turns shall be made gradually. For sharp curves or corners, cut fabric to size and place by hand. Hand broom or pneumatic roll to eliminate small wrinkles. Large wrinkles (with a height of 1 inch or more) shall be slit and laid flat in the direction of paving. Overlap joints 2 to 4 inches. Apply additional tack coat to joints and overlapped fabric layers to ensure proper fabric saturation. The tack coat temperature shall not exceed 325°F when the fabric is placed.

F. Hot Mix Overlay

Standard paving operations shall closely follow fabric laydown. All areas in which paving fabric has been placed shall be paved during the same day. If the fabric becomes wet, allow to dry before paving. Unless directed otherwise by the City of Engineer, a minimum compacted asphalt thickness of 1.5 inches shall be placed to provide adequate heat and pressure to bond the systems.

END OF SECTION 02500

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SECTION 02700 – SITE IMPROVEMENTS

1.0 DESCRIPTION OF WORK:

Work under this contract shall consist of **Kemper Station Bike/Hike Trail** as shown on the plans prepared by the City of Lynchburg, Office of Economic Development and constructed in accordance with the City of Lynchburg's Manual of Specifications and Standard Drawings, current printing; VDOT Road and Bridge Specifications, current printing; VDOT Road and Bridge Standards, current printing; and this Project Manual, together with the following modifications and any modifications noted on the plans.

2.0 MOBILIZATION:

This work shall consist of performing preparatory operations, including moving personnel and equipment to the project site; paying bonds and insurance premiums; and establishing the Contractor's facilities necessary to allow work to begin on a substantial phase of the contract.

Mobilization shall be paid for at the contract lump sum price. This price shall include demobilization.

Refer to VDOT specifications.

3.0 SILT FENCE:

This work shall include all materials, labor, and equipment to furnish, install, and maintain temporary silt fence. Extra-strength geotextile fabric shall be provided. Posts shall not be spaced more than ten feet apart. Posts shall be uniformly installed with an inclination toward the potential silt load area.

Fabric shall be firmly secured to the post. The bottom of the fabric shall be entrenched in the ground at least four inches. Fabric may be spliced only at support posts and with an overlap of at least six inches. The top shall be installed with a one-inch tuck or reinforced top end section. The height of the finished fence shall be a nominal thirty-five inches.

Temporary silt fences will be measured in linear feet, complete-in-place, and will be paid for at the contract unit price per linear foot. Price shall include furnishing and installing the fence; maintaining, removing, and disposing of the fence; and dressing the area.

4.0 WOODEN GUARDRAIL:

This work shall include all materials, labor, and equipment to furnish and install wooden guardrail as detailed on the plans.

Guardrail shall be paid for at the contract unit price per linear foot, complete-in-place.

5.0 RETAINING WALL:

This work shall include all materials, labor, and equipment to furnish and install formed concrete retaining wall as referenced in City General Specifications 4.14 and VDOT Drawing RW-3.

As an alternate to formed concrete, the City will consider Rockwood Retaining Wall, Classic 6" precast units, or approved equal. (Local representative, Boxley Block, Mike Moseley @ 434-942-1544).

Retaining wall shall be paid for at the contract unit price per cubic yard, complete-in-place, installed according to manufacturer's instructions.

6.0 TRASHCAN:

This work shall include all materials, labor, and equipment to furnish and install trash receptacles on four-inch thick concrete pad.

Receptacle shall be equal to Upbeat, Inc.—Iron Valley Steel Receptacle KRC-IVTR, side loading, color: black, surface mount. (Upbeat, Inc. @ 800-325-3047 or 314-535-4419)

Trash receptacle shall be paid for at the contract unit price for each, complete-in-place, including concrete pad, installed according to manufacturer's instructions and at exact locations as directed by City personnel.

7.0 BENCH:

This work shall include all materials, labor, and equipment to furnish and install benches on four-inch thick concrete pad.

Bench shall be equal to Upbeat, Inc.—8' Iron Valley Steel Bench KRC-IVBLF96, color: black, surface mount. (Upbeat, Inc. @ 800-325-3047 or 314-535-4419)

Bench shall be paid for at the contract unit price for each, complete-in-place, including concrete pad, installed according to manufacturer's instructions and at exact locations as directed by City personnel.

8.0 BIKE RACK:

This work shall include all materials, labor, and equipment to furnish and install bike racks on four-inch thick concrete pad.

Bike rack shall be equal to Upbeat, Inc.—High-Style Bike Rack FSC-LBR7PING, color: black, in-ground mount. (Upbeat, Inc. @ 800-325-3047 or 314-535-4419)

Bike rack shall be paid for at the contract unit price for each, complete-in-place, including concrete pad, installed according to manufacturer's instructions and at exact locations as directed by City personnel.

9.0 CHAIN LINK FENCE:

This work shall include all materials, labor, and equipment to furnish and install galvanized chain link fence, height of six or eight feet as designated on the plans. Reference VDOT specifications and standard FE-CL.

Chain link fence shall be measured in linear feet, complete-in-place, and will be paid for at the contract unit price per linear foot per height.

10.0 TRAIL MARKER AND SIGNS:

This work shall include all materials, labor, and equipment to furnish and install trail markers, directional signs, park rules signs, and safety signs as detailed on the plans.

Markers and signs shall be paid for at the contract unit price for each, complete-in-place, including stone and concrete for setting posts as shown on the plan detail.

11.0 LANDSCAPING:

This work shall include all materials, labor, and equipment to furnish and plant container-grown shrubs and balled and burlapped trees according to Virginia Department of Forestry standards and in locations to be directed by City personnel. Contractor shall furnish well-formed, true to type plantings with well-developed root systems, free from defects.

Plant trees in pits with vertical sides cut two feet greater than ball diameter and deep enough to allow six inches of compacted topsoil below ball or root of tree. Backfill with topsoil mixed with 1.5 pounds of 5-10-5 fertilizer per inch of caliper. Support trees with wire stays encased in section of garden hose, or similar material, placed around trunk in a single loop. Tighten wires by twisting strands together or by use of turnbuckles.

Plant shrubs in pits fifteen to eighteen inches deep backfilled with topsoil mixed with fertilizer, 0.25 pound per two-foot shrub height. Use 8-8-8 fertilizer with broadleaf evergreens and 5-10-5 with all others.

Trees and shrubs shall be paid for at the contract unit price for each planting. Plantings shall have a one-year warranty upon acceptance of construction. Contractor shall be responsible for watering until time of acceptance.

Refer also to 01000 – 1.35, A.

12.0 BELGIUM BLOCK:

This work shall include all materials, labor, and equipment to furnish and install belgium block.

Block shall be available from City stockpile at Public Services for hauling and placement by the Contractor. Contractor shall grade the subbase for positive drainage and continuity with surrounding area, form the concrete pad, then set the brick with sand joints. Refer to plan detail.

Block shall be paid for at the contract unit price per square foot, complete-in-place.

13.0 PERMITS:

Contractor shall obtain required permits from DEQ. The City of Lynchburg is covered under the general MS-4 permit. Contractor shall obtain VPDES storm water pollution permit.

02720 – STORM DRAINAGE

(Revised 09/15/03)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

Part 1 – General	Construction of Manholes/DI's	Manhole Frame & Cover Spec
Part 2 – Products	DIP Spec	Plain Concrete Pipe Spec
Part 3 – Execution	Drop Inlet Specs	Precast Structures Spec
		Reinforced Concrete Pipe Spec

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this specification.
- B. Section 01000 – GENERAL REQUIREMENTS.
- C. [Section 02220](#) – TRENCHING, BACKFILLING, AND COMPACTION OF UTILITIES.
- D. [Section 02730](#) – SANITARY SEWER.
- E. Any Specifications or details not covered herein shall be per Virginia Department of Transportation, *Road and Bridge Specifications*, 2002 or latest revision.

1.2 SUMMARY

This section includes all equipment, labor, material, appurtenances, and services required for complete installation of storm drainage piping, ditches, structures, and specialties for municipal drainage systems.

1.3 DEFINITIONS

For the purposes of this specification, the following definitions refer to storm water drainage systems and structures that come under the authority of the City of Lynchburg, Virginia as specified within this section and other sections of this manual.

Public Storm Drainage System: Drainage systems and their appurtenances required for the conveyance of public storm water from and across publicly maintained streets, roads, highways, and other public property and located within public rights-of-way and/or easements.

1.4 SUBMITTALS

- A. Submit shop drawings on all non-standard products/materials.
- B. Submit product data and shop drawings for the following in accordance with Section 01000, *General Requirements*.
 - 1) Drop/curb inlets
 - 2) Frame and covers
 - 3) Head/end walls
 - 4) Inlet grates
 - 5) Pipe and piping specialties
 - 6) Precast concrete manhole castings

1.5 QUALITY ASSURANCE

- A. Materials and operations shall comply with the latest revision of all applicable Codes and Standards.
- B. Piping materials shall be marked clearly and legibly.
 - 1) Reinforced Concrete Pipe shall be marked as follows:
 - a. Pipe Class,
 - b. Manufacturer
 - 2) Plain Concrete Pipe shall be marked as follows:
 - a. Pipe Class,
 - b. Manufacturer
 - 3) Ductile Iron Pipe shall show identification marks on or near bell as follows:
 - a. Weight,
 - b. Class or nominal thickness,
 - c. The letters "DI" or "Ductile,"
 - d. Manufacturer's identifying mark,
 - e. Year in which pipe was made,
 - f. Casting period.

1.6 STANDARD ABBREVIATIONS

AASHTO	American Association of State Highway Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute

AREA	American Railway Engineers Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
CRSI	Concrete Reinforcing Steel Institute
DIP	Ductile Iron Pipe
FS	Federal Specifications
MSDS	Material Safety Data Sheets
NCMA	National Concrete Masonry Association
OSHA	Occupational Safety and Health Administration
PCP	Plain Concrete Pipe
RCP	Reinforced Concrete Pipe
VDOT	Virginia Department of Transportation

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Pipe Condition/Pipe Examination

- 1) **New Pipe Inspection:** Inspect materials thoroughly upon arrival. Examine materials for damage. Remove damaged or rejected materials from site. Pipe shall be protected during handling against impact shocks and free fall. Pipe shall be kept clean at all times, and no pipe shall be used in the work that does not conform to the appropriate ASTM Specifications. Check bells and spigots closely for smoothness, roundness, and honeycombing (concrete pipe), which may be a source of infiltration. Check for cracks, chips, etc. on both ends. Reject any pipe that will not provide watertight seal or is otherwise structurally deficient.
- 2) **Pre-Installation Inspection:** Prior to being installed, each section of the pipe shall be carefully examined for damage and conformity with these specifications. All pipe damaged or deemed not to conform to these specifications shall be rejected and removed from site. All pipe in which the spigots and bells cannot be made to fit properly, or pipe, which has chipped bells or spigots, will be rejected. The faces of all spigots ends and of all shoulders on the bells must be true.

- B. Protect pipe coating during handling using methods recommended by the manufacturer. Use of bare cables, chains, hooks, metal bars, or narrow skids in contact with coated pipe is not permitted.
- C. Observe manufacturer's directions for delivery and storage of materials and accessories.

- D. Protect stored piping from entry of water or dirt into pipe. Protect bells and flanges of special fittings from entry of moisture and dirt.
- E. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.8 COORDINATION

Coordinate tie-in to municipal drainage systems with the City of Lynchburg City Engineer.

PART 2 – PRODUCTS

2.1 PIPE & FITTINGS

2.1.1 DUCTILE IRON PIPE

A. Ductile Iron Pipe

Ductile iron pipe shall be manufactured in accordance with all applicable requirements of AWWA C151/ANSI A21.51 and ASTM A746, *Standard Specification for Ductile Iron Gravity Sewer Pipe* for 4-inch and larger diameter pipe, thickness class rated, class 50 minimum. The thickness of Ductile Iron Pipe shall be determined by considering trench load in accordance with ANSI/AWWA C150/A21.50. Minimum laying length shall be 18 feet except for tie-in at a structure.

The ductile iron pipe shall be cement mortar lined with a seal coat in accordance with ANSI/AWWA C104/21.4. Outside coat shall be a minimum of 1 mil bituminous paint according to ANSI/AWWA C151/A21.21 Section 51-8.1.

Push-on and mechanical joint pipe shall be as manufactured by the American Cast Iron Pipe Company, United States Pipe and Foundry Company, Griffin Pipe Products Company, or McWane Cast Iron Pipe Company.

B. Ductile Iron Joints

Pipe joints may be either push-on or mechanical joint pipe sizes 4 inches through 48 inches in diameter. Rubber Gasket Joints and Mechanical Joints shall comply with AWWA C111/ANSI A21.11, ASTM A536 *Standard Specification for Ductile Iron Castings*. Acceptable pipe joints are as follows:

- 1) **Push-on Joint** Ductile Iron Pipe shall conform to AWWA C151/ANSI A21.51 (such as "*Fastite*," "*Tyton*," or "*Bell-Tite*"). The dimensions of the bell, socket, and plain end shall be in accordance with the manufacturer's standard design dimensions and tolerances. The gasket shall be of such size and shape to provide an adequate compressive force against the plain end and socket after assembly to affect a positive seal. Gaskets shall be vulcanized natural or vulcanized synthetic rubber, and comply with AWWA C111/ANSI A21.11.

- 2) **Mechanical Joint, Ductile Iron Pipe** shall be used only at the specific locations indicated on the drawings or as approved by the City Engineer.
- a. The mechanical joint shall consist of:
 - i. A bell cast integrally with the pipe or fitting and provided with an exterior flange having cored or drilled bolt holes and interior annular recesses for the sealing gasket and the spigot of the pipe or fitting;
 - ii. A pipe or fitting spigot;
 - iii. A sealing gasket;
 - iv. Separate ductile iron follower gland having cored or drilled bolt holes; and
 - v. Ductile iron tee head bolts and hexagon nuts.
 - b. The joint shall be designed to permit normal expansion, contraction, and deflection of the pipe or fitting while maintaining a leak proof joint connection. The mechanical joint shall conform to the requirements of Federal Specification WW-P-421, AWWA C111/ANSI A21.11, and ASTM A 536 Standard Specification of Ductile Iron Castings.

2.1.2 PLAIN CONCRETE PIPE

PCP shall be a minimum of Class III, Wall B. Concrete pipe joints shall be tongue and groove type unless otherwise specified. PCP pipe shall conform to the requirements of applicable sections of the latest revisions of the VDOT Road and Bridge Specifications.

PCP shall also meet ASTM C14, *Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe*, Extra Strength.

Gasketed Joints in Concrete Pipe shall meet ASTM C990, *Standard Specification for Joints in Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants*, latest revision.

2.1.3 REINFORCED CONCRETE PIPE

RCP shall be a minimum of Class III, Wall B. Concrete pipe joints shall be tongue and groove type unless otherwise specified. RCP shall conform to the requirements of applicable sections of the latest revision of the VDOT *Road and Bridge Specifications*.

RCP Class III or IV shall also meet ASTM C76, *Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe*.

Gasketed Joints in Concrete Pipe shall meet ASTM C990, *Standard Specification for Joints in Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants*, latest revision.

2.2 MISCELLANEOUS APPURTENANCES

2.2.1 BEDDING

See Section 02220, *Trenching, Backfilling, and Compaction of Utilities*.

2.2.2 CONCRETE BLOCK

Concrete block shall conform to the requirements of ASTM C139, *Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes*.

2.2.3 BRICK

Brick shall be hard clay, grade SM, ASTM C 32, *Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale)* and AASHTO M91.

2.2.4 MORTAR FOR CONCRETE BLOCK & BRICK

Mortar shall be type M, ASTM C 270, *Standard Specification for Mortar for Unit Masonry* and ASTM C 144, *Standard Specification for Aggregate for Masonry Mortar*. Mortar shall be prepared from cement in perfect condition and shall be prepared in boxes for that purpose. No mortar that has stood beyond forty-five minutes shall be used. Proportion by volume for the different types of application shall be as follows:

Brick masonry = 1 part cement to 2 parts sand

Pointing = 1 part cement to 1 part sand

2.2.5 MISCELLANEOUS CONCRETE

Concrete Classes (VDOT) to Design Compressive Strength at 28 days (f'c):

Class A4.5	General	4,500-psi
Class A4	General	4,000-psi
Class A3	General	3,000-psi
Class B2	Massive or Lightly Reinforced	2,200-psi

Ready mixed concrete shall comply with ASTM C94, *Standard Specification for Ready-Mixed Concrete*. All exposed concrete shall be air entrained. Concrete strength shall be as specified on standard details and drawings. Unless otherwise specified, all concrete shall be Class A3, minimum.

2.2.6 PORTLAND CEMENT

Type I, CSA normal, ASTM C150 *Standard Specification for Portland Cement*.

2.2.7 PRECAST REINFORCED CONCRETE STRUCTURES

Manholes of precast reinforced concrete shall be designed and manufactured in accordance with ASTM C478, *Standard Specification for Precast Reinforced Concrete Manhole Sections*, or latest revision. Manhole diameters shall be 4-foot minimum. The wall shall be a minimum of 5 inches thick and have a 6-inch minimum base. Manholes shall be of precast concrete manhole risers with a tongue and groove joint and a monolithic precast bottom, except where doghouse bases are to be used when placing manholes over existing mains. Joints shall be sealed with a minimum of butile mastic in conformance with AASHTO M 198, latest revision.

Manhole steps are not permitted.

Unless otherwise approved by the City Engineer, manholes will be precast reinforced concrete.

Manholes over 12 feet in depth, as measured from top of casting to effluent invert, shall have extended bases with appropriate reinforcing.

2.2.8 MANHOLE FRAMES AND COVERS

Standard Frames and Covers: Manhole frames and covers shall be manufactured from Class 30 gray iron, meeting the requirements of ASTM A48, *Standard Specification for Gray Iron Castings*. Standard manhole frames and covers shall be manufactured to the dimensions and configurations shown on **Standard Details 27.10 and 27.11** and shall have a minimum of 4 1-inch diameter holes in the flange of the frame. Minimum inside diameter of the opening shall be 24 inches. Manholes castings may be either bituminous coated or plain. The bearing surface of the frames and covers shall be machined and the cover shall seat firmly into the frame without rocking. Covers are to be embossed along the perimeter with the words "Storm." Approved castings are the US Foundry 710 ring and DP cover, East Jordan Iron Works 2027 frame and cover, or approved equal. (See **Standard Details 27.10 & 27.11**). All castings are to be USA made.

A Vulcan V-1883 is to be used with flat top manholes.

2.2.9 DROP INLETS

- A. Drop inlet tops shall be precast and shall conform to the requirements of all applicable sections of the latest revision of VDOT *Road and Bridge Specifications and Standards*.
- B. Drop inlet bases shall be precast and shall conform to the requirements of all applicable sections of the latest revisions of the VDOT *Road and Bridge Specifications and Standards*.
- C. Unless otherwise approved by the City Engineer, all drop inlet tops and bases will be precast reinforced concrete.
- D. Inlet Grates shall conform to the requirements of all applicable sections of the latest revision of the VDOT *Road and Bridge Specifications and Standards*.

2.2.10 MISCELLANEOUS STORMWATER APPURTENANCES

All miscellaneous stormwater appurtenances including but not limited to endwalls, headwalls, and flared end sections shall conform to all applicable sections of the latest revision of VDOT *Road and Bridge Specifications and Standards*.

PART 3 – EXECUTION

3.1 PIPE INSTALLATION - GENERAL

3.1.1 CONSTRUCTION – ALL PIPE

- A. **Trench Width:** Trench width shall be per **Standard Detail 27.01**.
- B. **Minimum Bury Requirements:** Minimum cover shall be in accordance with manufacturer's recommendations.
- C. **Pipe Laying Direction:** Place piping beginning at low point and progress uphill. Place on grade, with unbroken continuity in invert, horizontally and vertically, and on alignment as indicated on plans. Place bell ends of piping facing upstream. Install gaskets, seals, sleeve, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- D. **Directional Changes in Gravity Lines:** Use manholes for changes in direction of gravity lines.
- E. **Stringing out Pipe:** When pipe is strung out during unloading, it shall be set on high ground and in a position to prevent silt deposits, storm water, or other matter from entering the pipe prior to its placement in the trench.
- F. **Pipe Laying:** Pipe shall be bedded per Section 02220 – *Trenching, Backfilling and Compaction of Utilities*. The pipe and fittings shall be laid in the trench so that its interior surface shall conform to the grade and alignment as shown on the plans. Pipe laying shall be done in such a way as to disturb as little as possible the pipe that has already been laid. The alignment and grade of the storm main may be field adjusted whenever, in the opinion of the City Engineer, it is necessary, so long as the changes are consistent with the City of Lynchburg policy in affect at the time of the change. Changes in either grade or alignment may only occur at manholes.

Before laying, the bell and spigot will be wiped free from any dirt or other foreign matter. All surfaces of the portion of the pipe to be joined, and the factory-made jointing material, shall be clean and dry. Jointing material shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing material or factory-fabricated joints shall then be placed, fitted, and adjusted in such workmanlike manner as to obtain the degrees of water tightness required.

Trenches shall be kept as dry as possible during bedding, laying and jointing and for as long a period as required until the trench is backfilled. As soon as possible after the joint is made, sufficient backfill material shall be placed along each side of the pipe to offset conditions that might tend to move the pipe off line or grade.

The greatest care shall be used to secure water tightness and to prevent damage to or disturbing of the joints during the backfilling process, or at any other time.

After the trench foundation has been properly graded to receive the pipe, the pipe shall be carefully lowered into the trench with approved methods. Under no circumstances shall the pipe or accessories be dropped or dumped into the trench. All damaged pipe shall be replaced at the Contractor's expense.

At least 4 joints shall be left exposed for inspection purposes during the working day and a suitable ladder affording easy and safe access for such inspection shall be furnished.

Any defects due to settlement shall be made good by the Contractor at his own expense.

- G. **Temporary Suspension of Work:** When the trench is left for the night or if pipe laying is suspended, the upper end of the pipe shall be plugged to keep out dirt, water, animals and other foreign matter or substances. This plug shall be kept in the end of the pipe line at all times when laying is not in actual progress.
- H. **Cutting or Fitting Pipe:** Whenever a pipe requires cutting to bring a pipe to the required location, the work shall be done in a satisfactory manner with an approved cutting tool or tools which will leave a smooth end at right angles to the axis of the pipe and not otherwise damage the pipe. The method of cutting pipe shall be in accordance with manufacturer's recommendations. Such cuts shall be made by the Contractor without extra compensation.

3.1.2 DUCTILE IRON PIPE

- A. Bury limitations shall govern as follows based on the type laying condition:

Table 27.1			
Bury Limitations on DIP			
Pipe	Maximum Bury to Invert of Pipe ^a		
	Type 2 Laying Condition – Equivalent to Class D Bedding	Type 4 Laying Condition - Equivalent to Class C Bedding (See Detail 27.01)	Type 5 Laying Condition - Equivalent to Class B Bedding (See Detail 27.01)
8-inch DIP, Class 50	20 feet	34 feet	50 feet
10-inch DIP, Class 50	15 feet	28 feet	45 feet
12-inch DIP, Class 50	15 feet	28 feet	44 feet
14-inch DIP, Class 50	14 feet	27 feet	44 feet
16-inch DIP, Class 50	15 feet	28 feet	44 feet

^aLaying condition **Type 2** is a flat bottom trench with backfill lightly compacted to centerline of pipe (equivalent to Class D). Laying condition **Type 4** is a 4-inch bed of stone with pipe embedded to 1/8 pipe diameter (equivalent to Class C bedding). **Type 5** laying condition is also a 4-inch bed of stone with pipe embedded to the spring line of the pipe (equivalent to a Class B).

- B. Ductile Iron Pipe is approved for all storm uses within City Right-of-Way/Easements.

3.1.3 REINFORCED CONCRETE PIPE

- A. Pipe support for pipe shall provide uniform bearing for the pipe barrel along its entire length.
- B. **Minimum Pipe Bedding Class:** See Section 02220, *Trenching, Backfilling and Compaction of Utilities*, paragraph 3.3.2 for minimum bedding requirements.
- C. Pipe with varying wall class must not be mixed between manholes or boxes.

- D. **Bury Limitations:** Table 27.2 shall govern as the maximum allowable bury for concrete storm pipe:

Table 27.2				
Bury Limitations on RCP (15 through 60 inches)				
Pipe Class	Maximum Depth of Bury ^a			Max Trench Width (feet)
	Class III (feet)	Class IV (feet)	Class V (feet)	
15-inch	9.5	14.5	23.0	4.0
18-inch	9.5	15.0	32.5	4.0
24-inch	11.5	23.0	50.0	4.0
30-inch	11.0	19.5	44.5	5.0
36-inch	10.5	18.0	35.0	6.0
42-inch	11.0	19.0	36.5	6.5
48-inch	11.5	19.5	37.5	7.0
54-inch	12.0	20.0	38.5	7.5
60-inch	12.0	20.5	38.5	8.0

^a Based on saturated clay weighing 120 pcf, trench width as specified, class C stone bedding, 1350 plf per ft of internal diameter for class III and 2000 plf per ft of internal diameter for class IV, 3000 plf per ft of internal diameter for class V, D_{0.01} crack

- E. Join concrete pipe using bitumastic material to seal joint.
- F. As each joint is laid, visually inspect to be certain that no jointing compound gasket, or trash is protruding from the joint or lying inside the pipe.

3.1.4 PLAIN CONCRETE PIPE

- A. Plain Concrete Pipe is approved for storm uses in non-traffic bearing situations only.
- B. Pipe support for pipe shall provide uniform bearing for the pipe barrel along its entire length.
- C. Minimum pipe bedding class: *see 3.1.3, paragraph B, above.*
- D. Pipe with varying wall class must not be mixed between manholes or boxes.

- E. **Bury Limitations:** See *Table 27.3, below.*

Table 27.3 Bury Limitations on PCP (12 through 24 inches)	
Pipe Diameter	Maximum Depth of Bury Non Reinforced (feet)
12-inch	9.5
15-inch	9.5
18-inch	10.5
21-inch	11.0
24-inch	11.5

- F. Join concrete pipe using bitumastic material to seal joint.
- G. As each joint is laid, visually inspect to be certain that no jointing compound, gasket, or trash is protruding from the joint or lying inside the pipe.

3.2 MANHOLE CONSTRUCTION FOR STANDARD MANHOLES AND DROP INLET BASES

- A. **Standard Manholes and Drop Inlet Bases:** Manholes shall be constructed in accordance with **Standard Details 27.02** and **27.03** with the following exceptions:

Flexible boots and precast concrete inverts will not be required.

Joints will be as specified in the product section of this specification.

The pipe opening in precast units shall be at least 4 but not more than 8 inches larger than the outside diameter of the pipe. Pipe openings shall be formed, drilled, or neatly cut as approved by the Engineer.

The contractor may use brick and masonry block or concrete pipe cutoffs in conjunction with mortar to fill the void between pipe culverts and precast structures. Such materials shall be thoroughly wetted and bonded with mortar. The remaining exterior and interior void shall be filled and sealed/slicked with mortar to the contour of the precast structure.

The standard joint shall be sealed on the interior of the structure, after installation, with a non-shrink hydraulic cement mortar per *VDOT Road and Bridge Specifications*, Section 218.

Plug all weep holes with mortar.

Pour concrete inverts in all structures. Concrete shall be in compliance with products section for miscellaneous concrete of these specifications. Shape manhole channel with a smooth semicircular bottom matching inside diameter of the connecting pipe/pipes. Change directions of flow with a smooth curve of as large a radius as the manhole size will permit. Change size and grade of channels gradually and evenly. Shape the shelf to provide a slope between 1 and 2 inches per foot towards the invert.

Manholes shall be installed plumb.

- B. **Grade Rings/Adjustments:** The contractor shall exercise care in the ordering of structures so that the use of grade rings or brick for leveling and adjustments can be minimized. Where adjustment of a manhole is required, grade rings shall be used unless otherwise approved by the City Engineer. Where adjustment of the inlet is required, the use of bricks or grade rings is approved, provided that the entire void between the flat-top and inlet is also filled with brick and mortar to uniformly distribute loading of the inlet. The combination of grade rings or depth of bricks shall not exceed 12 inches before removal of the cone or flat-top is necessary for adjustment.

On all storm manholes, a mastic joint material shall be placed between the frame and cover and the cone or grade ring.

When applicable, during the installation of manholes, if frame and cover is near or within wheel path in roadway, turn cone to place the frame out of wheel path.

C. **Replacement/Rehabilitation of Existing Manholes**

When a new manhole is necessary, the old manhole must be completely removed and a new precast manhole constructed in its place. Where the old manhole is of satisfactory quality, the Contractor will make connection thereto as directed by the City Engineer at no additional cost even if it is necessary to modify the bottom of the manhole to meet the new grade. Such extras are considered to be incidental to the manhole connection cost.

3.3 INLET CONSTRUCTION AND MISCELLANEOUS APPURTENANCES

Construct inlets, end walls, and other storm drainage items as detailed in the latest edition of the *VDOT Road and Bridge Specifications and Standards*.

Adjusting inlet tops and/or miscellaneous appurtenances shall follow same guidelines as prescribed in 3.2, *Manhole Construction for Standard Manholes and Drop Inlet Bases*, paragraph B. *Grade Rings/Adjustments*, above.

3.4 ABANDONING STORM LINES & MANHOLES

- A. **Storm Lines:** When an existing storm line is designated to be abandoned in place, the low end of the line is to be plugged and lean concrete grout (flowable fill) pumped into the line until line is completely filled.
- B. **Manholes:** When an existing manhole, either partially or wholly, is designated to be abandoned and the storm lines, either entering or exiting the manhole, have been abandoned according to the preceding paragraph, the upper portion of the manhole shall be removed to a minimum of 18 inches below the proposed finished grade, or as determined by the City Construction Coordinator, VDOT #57 stone dumped into the manhole, and the stone vibrated to consolidate the stone. The remainder of the fill between the top of the manhole and the finished subgrade is to be backfilled as follows. Where the manhole is located within a roadway right of way, backfill with VDOT # 57 Stone and consolidate. Outside roadway right of ways, filter fabric shall be placed over the stone, suitable material of a compactable nature shall be placed over the top of the manhole, and the material tamped.

3.5 SLOPE ANCHORS

All lines on slopes equal to or greater than 20% slope shall have concrete anchors placed around the pipe directly below the bell end of the line. The anchors shall be spaced every other joint unless otherwise shown on the plans and constructed to the dimensions shown in **Standard Detail 27.21**.

3.6 EXCAVATION OF DRAINAGE CHANNELS

- A. Open storm drainage channels and ditches shall be graded and shaped in accordance with the elevations, slopes, widths, and lengths indicated on the plans. The outfall elevation of the new channels and ditches shall be graded to match the flow elevations of all existing or natural channels, unless indicated or specified otherwise.
- B. The drainage channels shaped with fill materials shall be compacted within the limits and in accordance with the related backfill work specified elsewhere.
- C. The drainage channels shall be prepared, seeded, and mulched in accordance with the related work specified elsewhere. Where indicated or specified, erosions control measures, such as temporary liners, rip rap, concrete, etc., shall be provided.

3.7 INSPECTION

Upon completion of entire pipe installation, the City Engineer may inspect the work in part or as a whole as will satisfy himself/herself that every portion of the contract has been faithfully carried out.

If, in the opinion of the City Engineer, a defect exists in the pipeline or its appurtenances, in some place not accessible except by uncovering, the City Engineer may order the line to be uncovered. If it is found that after the pipe has been uncovered at the order of the City Engineer, no defect exists or that the defects were not the fault of the contractor, then the expense so incurred by the contractor shall be borne by the City.

Flush all sand, dirt, and debris from the lines prior to inspection. Provide lights and mirrors and inspect lines in the presence of the Construction Coordinator.

Inspect the system for conformance with line and grades shown on the plans and provide record drawing measurements on record drawings.

Visual Inspection: All lines and manholes shall be visually inspected by the City of Lynchburg from every manhole by use of mirrors or television cameras. The lines shall exhibit a fully circular pattern when viewed from one manhole to the next. Lines, which do not exhibit a true and correct line and grade, have obstruction or structural defects, shall be corrected to meet these specifications and the barrel left clean for its entire length.

END OF SECTION 02720

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APPENDIX A

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

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ATTACHMENTS

A. Employment Preference for Appalachian Contracts (included in Appalachian contracts only)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendent and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary

e The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of U.S. DOL) and Helpers:

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or

subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified

and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project: **NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS**

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false

representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from

participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A- EMPLOYMENT PREFERENCE FOR
APPALACHIAN CONTRACTS**

(Applicable to Appalachian contracts only)

During the performance of this contract the contractor undertaking to do work which is or reasonably may be done as on-site work. shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated or the subregion or the Appalachian counties of the State wherein the contract work IS situated. except:

- a. To the extent that qualified persons regularly residing in the area are not available
- b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.
- c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract provided that the number of nonresident persons employed under this subparagraph 1c shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work. except as provided in subparagraph 4 below.
2. The contractor shall place a job order with the State Employment Service ice indicating (a) the classifications of the laborers mechanics and other employees required to perform the contract work (b) the number of employees required in each classification.
- (c) the date on which he estimates such employees will be required and (d) any other pertinent information required by the State Employment Service to complete the job order form The job order may be c ace c with the State Employment Service in writing or by telephone if during - the course of the contract work the information submitted c, the contractor lnk the original job order is substantially modified by shall promptly notify the State Employment Service.
- 3 The contractor shall give full consideration on to all! qua;. qualified applicants referred to him by the State Employment. Service The contractor so not required to grant employment to any lob applicants who in his opinion are not qualified to perform the classification of work required.
4. If within 1 week following the placing of a job order by the contractor with the State Employment Service the State Employmeny Service is unable to refer any qualified job applicants to the Contractor or less than the number requested the State Employment Service foward a certificate to the contractor indicating the unavailblty or c applicants Such certificate shall be made a Pan of thee Contractor's permanent project records. Upon receipt of this certificate a:e the contractor may employ persons who do not normally reside ink :-e labor area to fill positions covered by the certificate notwithstanding the provisions of subparagraph 1c above.
- 4 of this Attachment A in every subcontract for work which is or reasonably may be. done as on-site work.

APPENDIX B

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE
EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals for female and minority participation, expressed in percentage terms of the Contractor's aggregate work force in each trade on all construction works in the covered area, are as follows:

Females- 6.9%

Minorities - See Attachment "A"

The goals are applicable to all the Contractor's construction work performed in the covered area, whether or not it is Federal or federally assisted. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications, set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established herein. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executives Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 workings days the award of any construction subcontract in excess of \$10,000 at any tier for construction works under this contract. The notification shall list the name, address and telephone number of the subcontractor, employer identification number, estimated dollar amount of the subcontract, estimated starting and completion dates of the subcontract. and the geographical area in which the contract is to be performed.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY
CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

1. As, used in this provision:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;

d. "Minority" includes:

- (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
- (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
- (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
- (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors and Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction Contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, shall assign two or more women to each construction project. The Contractor shall specifically ensure that all foreman, superintendents and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union, or if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.
 - d. Provide immediate written notification to the Director when the union or unions which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7b above.
 - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper or annual report; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
 - g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents and General Foremen prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed and disposition of the subject matter.
 - h. Disseminate the Contractor's EEO policy externally by including in any news media advertisement that the Contractor is "An Equal Opportunity Employer" for minority and female,

and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

- i. Directs its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.
 - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of Contractor's workforce.
 - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for such opportunities through appropriate training or other means.
 - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n. Ensure that all facilities and company activities are nonsegregated, except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
9. Goals for women have been established. However, the Contractor IS required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner, that is even though the Contractor has achieved its goals for women, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex or nation origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from Its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director will proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate and make known to the Department a responsible official as the EEO Officer to monitor all employment related activity, to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors will not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

ATTACHMENT A

<u>Economic Area</u>	<u>Goal (Percent)</u>
Virginia:	
021 Roanoke-Lynchburg, VA	
SMSA Counties:	
4640 Lynchburg, VA.....	19.3
VA Amherst; VA Appomattox; VA Campbell; VA Lynchburg.	
6800 Roanoke, VA.....	10.2
VA Botetourt; VA Craig; VA Roanoke; VA Roanoke City; VA Salem	
Non-SMSA Counties.	12.0
VA Alleghany; VA Augusta; VA Bath; VA Bedford; VA Bland; VA Carroll;	
VA Floyd; VA Franklin; VA Giles; VA Grayson; VA Henry; VA Highland;	
VA Montgomery; VA Nelson; VA Patrick; VA Pittsylvania; VA Pulaski;	
VA Rockbridge; VA Rockingham; VA Wythe; VA Bedford City; VA Buena Vista;	
VA Clifton Forge; VA Covington; VA Danville; VA Galax; VA Harrisonburg;	
VA Lexington; VA Martinsville; VA Radford; VA Staunton; VA Waynesboro;	
WV Pendleton.	
022 Richmond, VA:	

SMSA Counties:	
6140 Petersburg - Colonial Heights - Hopewell, VA.....	30.6
VA Dinwiddie; VA Prince George; VA Colonial Heights; VA Hopewell; VA Petersburg.	
6760 Richmond, VA	24.9
VA Charles City; VA Chesterfield; VA Goochland, VA Hanover; VA Henrico; VA New Kent; VA Powhatan; VA Richmond.	
Non-SMSA Counties	27.9
VA Albermarle; VA Amelia; VA Brunswick; VA Buckingham, VA Caroline; VA Charlotte; VA Cumberland; VA Essex; VA Fluvanna; VA Greene; VA Greensville; VA Halifax; VA King and Queen; VA King William; VA Lancaster; VA Louisa; VA Lunenburg; VA Madison; VA .Mecklenburg; VA Northumberland; VA Nottoway; VA Orange; VA Prince Edward; VA Richmond VA Sussex; VA Charlottesville; VA Emporia; VA South Boston	
023 Norfolk - Virginia Beach - Newport News VA:	
SMSA Counties:	
5680 Newport News- Hampton, VA	27.1
VA Gloucester; VA James City; VA York; VA Hampton; VA Newport News; VA Williamsburg.	
5720 Norfolk - Virginia Beach - Portsmouth, VA - NC.....	26.6
NC Currituck; VA Chesapeake; VA Norfolk; VA Portsmouth; VA Suffolk; VA Virginia Beach.	
Non-SMSA Counties	29.7
NC Bertie; NC Camden; NC Chowan; ,NC Gates; NC Hertford; NC Pasquotank; NC Perquimans; VA Isle of Wight; VA Matthews; VA Middlesex; VA Southampton;VA Surry; VA Franklin.	
Washington, DC:	
020 Washington, DC.	
SMSA Counties:	
8840 Washington, DC - MD - VA	28.0
DC District of Columbia; MD Charles; MD Montgomery MD Prince Georges; VA Arlington; VA Fairfax; VA Loudoun; VA Prince William VA Alexandria; VA Fairfax City; VA Falls Church.	
Non- SMSA Counties	25.2
MD Calvert; MD Frederlck; MD St. Marys; MD Washington; VA Clarke; VA Culpeper; VA Fauquier; VA Frederick; VA King George; VA Page; VA Rappahannock; VA Shennandoah; VA Spottsylvania; VA Stafford; VA Warren; VA Westmoreland; VA Fredericksburg; VA Winchester WV Berkeley; WV Grant; WV Hampshire; WV Hardy; WV Jefferson; WV Morgan.	
Tennessee:	
052 Johnson City - Kingsport - Bristol, TN - VA	
SMSA Counties:	
3630 Johnson City - Kingsport -Bristol, TN-VA	2.6
TN Carter; TN Hawkins; TN Sullivan; TN Washington; VA Scott: VA Washington;VA Bristol.	
Non-SMSA Counties	3.2
TN Greene; TN Johnson; VA Buchanan;VA Dickenson; Va Lee; VA Russell; VA Smyth; VA Tazewell; VA Wise; VA Norton; WV McDowell; WV Mercer.	
Maryland	
019 Baltimore MD:	
Non-SMSA Counties	23.6
MD Caroline; MD Dorchester; MD Kent; MD Queen Annes; MD Somerset; MD Talbot; MD Wicomico; MD Worchester; VA Accomack; VA Northampton.	

APPENDIX C

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
USE OF DOMESTIC MATERIAL

May 3, 1995c
Reissued July 9, 2002

Section 102.05 Preparation of Bid of the Specifications is amended to include the following:

Except as otherwise specified, all iron and steel products (including miscellaneous steel items such as fasteners, nuts, bolts and washers) incorporated for use on this project shall be produced in the United States of America; unless the use of any such items will increase the cost of the overall project by more than 25 percent. "Produced in the United States of America" means all manufacturing processes whereby a raw material or a reduced iron ore material is changed, altered or transformed into an item or product which, because of the process, is different from the original material, must occur in one of the 50 States, the District of Columbia, Puerto Rico or in the territories and possessions of the United States. Raw materials such as iron ore, pig iron, processed, pelletized and reduced iron ore and other raw materials used in steel products may, however, be imported. All iron and steel items will be classified hereinafter as "domestic" or "foreign", identified by and subject to the provisions herein. In the event use of the aforementioned "domestic" iron and steel will increase the cost of the overall project by more than 25 percent, the Contractor may furnish either "domestic" or "foreign" items.

In the event the Contractor proposes to furnish "foreign" iron and steel and can verify a savings in excess of 25 percent of the overall project cost, the bid proposal (Form C-7 and Supportive Data supplement) shall be completed using the best price offer for each bid item.

Award of the contract will be made to the bidder who submits the lowest total bid based on furnishing "domestic" iron and steel items, unless such total bid exceeds the lowest total bid based on furnishing "foreign" iron and steel items by more than 25 percent.

The information listed on the Supportive Data sheet will be used to provide the basis for verification of the required cost savings. In the event comparison of the prices given, or corrected as provided in Section 103.01 of the Specifications, shows that use of "foreign" iron and steel does not represent a cost savings exceeding the aforementioned 25 percent, "domestic" iron and steel and prices given therefor shall be used and the "100 percent Domestic Items Total" shall be the Contractor's bid.

In the event the total cost of all "foreign" iron and steel does not exceed one-tenth of one percent of the total contract cost or \$2,500, whichever is greater, the use of such material will not be restricted by the requirements herein. However, by signing the bid, the Bidder certifies that such cost does not exceed the limits established herein.

Prior to final payment the Contractor shall obtain from the supplier and furnish to the Department a certificate of compliance with the domestic requirements herein. The Contractor may personally certify that miscellaneous iron and steel and hardware conforms to the domestic requirements herein.

APPENDIX D

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
SECTION 110.04

January 5, 2000
Reissued July 9, 2002

Section 110.04 of the Specifications is replaced by the following:

Section 110.04 Use of Disadvantaged Business Enterprises:

Policy

It is the policy of the Virginia Department of Transportation (VDOT) that Disadvantaged Business Enterprises (DBEs) shall have the maximum opportunity to participate in VDOT contracts, and that the Contractor shall take all necessary steps to ensure that DBEs have such opportunity. The Contractor shall comply with the requirements of 49 CFR Part 26 and other applicable specifications.

Definitions

Disadvantaged business enterprise or DBE means a for-profit small business concern as defined in Section 3 of the Small Business Act and relevant regulations that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.

Socially and economically disadvantaged individuals mean those individuals whom are citizens of the United States or lawfully admitted permanent residents and who are:

Women;

Black Americans - persons having origins in any of the black racial groups of Africa;

Hispanic Americans - persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;

Native Americans - persons who are American Indians, Eskimos, Aleuts, Native Hawaiians, or Alaskan Natives;

Asian-Pacific Americans - persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong.

Subcontinent Asian Americans - persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal, or Sri Lanka;

Any additional groups whose members are designated as socially and economically disadvantaged by the SBA.

Any individual who VDOT finds to be socially and economically disadvantaged on a case-by-case basis.

General

Upon request the Department will furnish a list of certified DBEs. This list is not an endorsement of the quality or performance of the business, but is only a listing of firms who are certified by the Department as DBEs.

Cost plus subcontracts will not considered to be in accordance with normal industry practice and will not normally be allowed for credit.

By signing the bid, the bidder certifies that on work proposed to be sublet, the bidder has taken or will take affirmative action to seek out and consider DBEs as potential subcontractors. The Contractor shall contact DBEs to solicit their interest, capability, and prices in sufficient time to allow them to respond effectively, and shall retain, on file, proper documentation to substantiate its good faith efforts. Sufficient time for this provision will be determined by individual projects and business needs. However, five business days are usually enough.

VDOT will monitor the Contractor's DBE involvement during performance of the contract. The level of effort by the Contractor in meeting or exceeding the requirements in the contract, or his attempts to do so; or, his efforts in soliciting such involvement if no requirement is established, will be a relevant factor in determining the Contractor's performance rating for future prequalification.

The Contractor shall furnish, and shall require each subcontractor to furnish, information relative to all DBE involvement on the project for each month during the life of the contract in which participation occurs and verification is available. The information shall be indicated on Form C-63 and certified on Form C-63A or by copies of cancelled checks with appropriate identifying notations. Failure to provide the forms to the Engineer by the Contractor's monthly progress estimate date may result in delay of approval of the Contractor's monthly progress estimate for payment. The names and certification numbers of DBE firms provided by the Contractor on various forms indicated herein shall be exactly as shown on the Department's latest list of certified DBEs. Signatures on all forms indicated herein shall be those of authorized representatives of the Bidder as shown on Form C-32 or C-32A, or authorized by letter from the Bidder. If certified DBE firms are used which have not been previously documented, including those on projects with no requirements established, the Contractor shall be responsible for submitting necessary documentation to cover such work prior to the DBE beginning work.

Any agreement between a bidder and a DBE whereby the DBE promises not to provide quotations for performance of work to other bidders is prohibited.

The Contractor shall designate and make known to the Engineer a liaison officer who is assigned the responsibility of administering and promoting an active program for use of DBEs.

The Contractor is encouraged to use the services of banks owned or controlled by disadvantaged individuals; however, use of their services will not be credited toward attainment of the participation established for the contract. The Department has on file, and will make available on request, the names and addresses of known disadvantaged owned banks in Virginia.

All time frames referenced in this provision are expressed in calendar days. Should the expiration of any deadline fall on a weekend or holiday, such deadline will automatically be extended to the next normal workday.

All sanctions noted in this provision are automatic unless the Contractor exercises the right of appeal within the required time frame(s). Panel hearing requirements, processes, and procedures shall be in accordance with guidelines current at the time of proceedings.

DBE Participation Counted Toward Goals

DBE bidders on prime contracts shall make the same outreach efforts as non-DBE bidders and to document good faith efforts in situations where they do not fully meet contract goals.

When a DBE participates in a contract, only the value of the work actually performed by the DBE is counted toward DBE goals.

The entire amount of that portion of a construction contract that is performed by the DBE's own forces is counted. The cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE except supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate is included.

The entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a contract, toward DBE goals, provided the fee is determined to be reasonable and not excessive as compared with fees customarily allowed for similar services, is counted.

When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward DBE goals only if the DBE's subcontractor is, a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward DBE goals.

When a DBE performs as a participant in a joint venture, only the portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the DBE performs with its own forces toward DBE goals is counted.

Expenditures to a DBE contractor toward DBE goals are counted only if the DBE is performing a commercially useful function on that contract.

A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE shall also be responsible, with respect to materials and supplies used on the contract, for negotiating prices, determining quality and quantity, ordering the material, and installing where applicable and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the amount of work subcontracted, industry practices, a fair price for the value of the work actually performed and the DBE credit claimed for its performance of the work, and other relevant factors, will be evaluated.

A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. If it is determined that the DBE is an extra participant, similar transactions, particularly those in which DBEs do not participate will be examined. When a DBE is determined to not be performing a commercially useful function, the DBE may present evidence to support his position of performing a commercially useful function.

If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its Contract with its own work force, or the DBE subcontracts a greater portion of the work of a

contract than would be expected on the basis of normal industry practice for the type of work involved, it will be determined that the DBE is not performing a commercially useful function.

A DBE Trucking Company will be determined to be performing a commercially useful function by using the following factors:

The DBE will be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.

The DBE will itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

The DBE will receive credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.

For purposes of this provision a lease shall indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks shall display the name and identification number of the DBE.

Materials or Supplies shall be counted toward DBE goals as provided in the following:

If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will be counted toward DBE goals.

If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies is counted toward DBE goals.

When a contractor has made a commitment to use a firm that is not currently certified (ineligible), and a subcontract has not been executed, the ineligible firm does not count toward the contract goal or overall goal. The prime Contractor shall meet the contract goal with an eligible DBE firm or demonstrate to the Engineer that he has made a good faith effort to do so.

When a contractor has executed a subcontract with a firm before it has been notified of its ineligibility, the prime contractor may continue to use the firm on the contract, and may continue to receive credit toward its DBE goal for the firm's work. The portion of the ineligible firm's performance remaining after VDOT has issued the notice of ineligibility shall not count toward the overall goal, but may count toward the contract goal.

When VDOT has executed a prime contract to a DBE that was later ruled ineligible, the portion of the ineligible firm's performance of the contract remaining after VDOT has issued the notice of its ineligibility shall not count toward the overall goal, but may count toward the contract goal except that if the DBE's ineligibility is caused solely by its having exceeded the certification size standard

during the performance of the contract, its total participation on that contract may be counted toward overall and contract goals.

Award Documentation and Procedures

Within 28 days after the opening of bids in accordance with the requirements of Section 102.12 of the Specifications, the apparent low bidder as read at the bid opening shall furnish a fully completed Form C-111. The Bidder shall also submit evidence of a binding agreement on Form C-112, Certification of Binding Agreement, for each DBE within 28 days of the bid opening. If the Bidder is aware of any assistance beyond the DBE's existing resources which are required for the performance of the work, a narrative statement outlining the assistance shall be attached to the appropriate C-112, in order that VDOT might make a reasonable judgement as to the allowance of credit. Any award made by the CTB prior to receipt of the information required will be conditional, pending receipt of such information.

If it is determined subsequent to the bid opening that the apparent low bidder has changed, the new apparent low bidder will be advised by letter and shall submit the information required herein within 28 days after the date of the letter.

In order to award a contract to a bidder that has failed to meet DBE contract requirements the Department will determine if the bidder's efforts were "reasonable good faith efforts, and were those that given all relevant circumstance, a bidder actively and aggressively seeking to meet the requirements would make. Efforts to obtain DBE participation are not good faith efforts if they could not reasonable be expected to produce a level of DBE participation sufficient to meet the requirements.

Good Faith Efforts may be determined through use of the following list of the types of actions the bidder may make to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

Soliciting through all reasonable and available means such as but not limited to attendance at pre-bid meetings, advertising and written notices to all certified DBEs who have the capability to perform the work of the contract. Examples may include advertising in at least one daily newspaper of general circulation, phone contact with completely documented telephone log including date and time called, contact person or voice mail status, and internet contacts with supporting documentation, including dates advertised. The bidder shall solicit this interest no less than 5 business days before the bids are due so that the DBEs have enough time to respond to the solicitation. The bidder shall determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with his own forces.

Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

Negotiating in good faith with interested DBEs: It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers, and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

A bid cannot reject a DBE for being unqualified without sound reasons based on a thorough investigation of their capabilities. The DBE's standing within its industry, membership in specific groups, organizations, associations and political or social affiliations, and union vs. non-union employee status are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the Department or contractor;

Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services;

Effectively using the services of appropriate personnel in the Department and Virginia Department of Minority Business Enterprises, (VDMBE); available minority/women community or minority organizations; contractors' groups; local, state, and Federal minority/ women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

If the bidder fails to meet the participation requirements or fails to submit the required information within the specified 28 days, the bid may be rejected and the bidder and any affiliated company, which shall include any company having essentially the same management or directors and all members of a joint venture, will be enjoined from bidding for 90 days. The bidder and any affiliated company will also be ineligible to bid on this project or any project embracing this same work, should readvertisement occur. Award may then be made to the next lowest responsible bidder or the work may be readvertised and constructed under contract or otherwise, as determined by the CTB.

Prior to such action, the bidder will be given 7 days in which to request an appearance before the panel to present such evidence as is necessary to establish that failure to meet requirements is through no fault of his own, and that a reasonable good faith effort has been made to meet the established requirements. The decision of the panel shall be administratively final. The injunction period will begin upon failure of the bidder to request the hearing within the designated time frame, or upon the panel's decision to enjoin, as applicable.

If sufficient evidence is presented to demonstrate that a good faith effort was made, the contract may be awarded, and the DBE requirement reduced to the actual commitment at the time of contract execution.

If the apparent low bidder fails to establish and use reasonable good faith efforts, the Engineer may make a determination and recommendation to the Commissioner and CTB that it is in the Commonwealth's best interest to award such contract. The CTB may, upon such basis, elect to award the contract. However, such action will not relieve the Contractor of the responsibility for complying with 100 percent of the required DBE participation during the life of the contract or the sanction of enjoinder,

Post Award Documentation and Procedures

On contracts awarded on the basis of good faith efforts or in the Commonwealth's best interest, progress schedule information requirements and subsequent progress determination shall be based on the commitment information shown on the latest C-111 as compared with the appropriate C-63.

Within 30 days after the notice to proceed and prior to the first estimate, the Contractor shall submit, for approval, a schedule of DBE participation which will occur during the contract and which will result in 100 percent of the participation required in the contract, except as provided hereinbefore. The schedule shall show the DBE participation as a percentage of the contract value that will occur at the completion of each major component of work shown on the Contractor's progress schedule. If the contract does not require a progress schedule, the schedule of DBE participation shall be submitted prior to beginning operations, and shall show the DBE participation that will occur at the quarter points of the contract dollar amount, the specific items of work, and the total amount of allowable credit per item for the DBEs performing work shown on the progress schedule or during each quarter of work of the contract as applicable. The contractor shall also submit prior to commencement of work copies of the actual subcontract agreements and associated documentation for each DBE firm being used. The Contractor can be given the option to submit the schedule showing participation at the completion of each component, should it be deemed beneficial. The Contractor shall also submit, prior to commencement of work, copies of the actual subcontract agreement(s) and associated documentation for each DBE firm being used.

Prior to beginning each component or quarter of the work, as applicable, in which DBE work is to be performed, the Contractor shall furnish a revised Form C-111 showing the name(s) and certification number(s) of any currently certified DBEs not previously submitted who will perform the work during that component or quarter. If the Contractor is aware of any assistance beyond a DBE's existing resources which has not been previously approved, the Contractor shall submit a new or revised narrative statement for the Engineer's approval prior to assistance being rendered.

If the Contractor fails to comply with any of the required submissions within the specified time frame, the Contractor and any aforementioned affiliates may be enjoined from bidding on future work until such time as the submissions are received by the Department.

If a DBE, through no fault of the Contractor, is unable or unwilling to perform as indicated on Form C-111, or materially defaults in the performance of obligations, the Contractor shall immediately notify the Engineer and provide documentation of all relevant circumstances. If the Contractor requests to be relieved of the obligation to use the named DBE, and the Engineer relieves the Contractor of that obligation, the Contractor shall immediately make good faith efforts to obtain another currently certified DBE to perform an equal or greater dollar value of allowable credit. The DBE name(s) and certification number(s) shall be submitted to VDOT on a revised Form C-111 prior to the DBE beginning the work.

Failure on the part of the DBE will not relieve the Contractor of responsibility for obtaining required participation on the contract, but will be taken into consideration prior to action against the Contractor for non-compliance with the approved schedule of DBE participation.

Unless otherwise specified herein, failure to conform to the schedule of DBE participation at the completion of any component of work or quarter point of contract amount as shown on the progress schedule, or at any point at which it is clearly evident that the remaining dollar value of allowable credit for performing work is insufficient to obtain the scheduled participation, may result in the Contractor and any aforementioned affiliates being enjoined from bidding for 60 days or until such time as conformance with the schedule of DBE participation is achieved; or, in the instance of credit disallowance, evidence is presented demonstrating the means by which an amount of replacement credit equal to or greater than that disallowed is to be achieved, whichever is the lesser.

If the Contractor fails upon completion of the project to meet the required participation, the Contractor and any aforementioned affiliates will be enjoined from bidding for a 90-day period.

Prior to enjoinder from bidding for failure to comply with participation requirements, as provided hereinbefore, the Contractor may submit documentation to the Engineer to substantiate that failure was due solely to quantitative underrun(s) or elimination of items subcontracted to DBEs, and that all feasible means have been used to obtain the required participation. The Engineer upon verification of such documentation may make a determination that the Contractor has met the requirements of the contract.

If it is determined that the aforementioned documentation is insufficient or the failure to meet required participation is due to other reasons, the Contractor may request an appearance before the panel to establish that all feasible means were used to meet such participation requirements. The panel's decision shall be administratively final. The enjoinder period will begin upon the Contractor's failure to request a hearing within the designated time frame or upon the panel's decision to enjoin, as applicable.

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
110B - SECTION 110.04
Use of Minority Business Enterprises

March 5, 1997

Section 110.04 of the Specifications is replaced by the following:

Section 110.04 Use of Minority Business Enterprises (MBEs)

It is the policy of the Department that Minority Business Enterprises (MBEs) shall have the maximum opportunity to participate in the performance of the Contract. The Contractor is encouraged to take necessary and reasonable steps to ensure that MBEs have the maximum opportunity to compete for and perform work on the Contract, including participation in any subsequent subcontracts.

MBE shall mean a small business concern (as defined pursuant to Section 3 of the Small Business Act and implementing regulations) which is owned and controlled by one or more minorities or women. *Owned and controlled* means: at least 51 percent of the business is owned by one or more minorities or women or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more minorities or women; and the management and daily business operations are controlled by one or more such individuals.

Minority shall mean a person who is a citizen or lawful permanent resident of the United States and is a bona fide member of a minority group, so regarded by that particular minority community, and who is:

Black (a person having origins in any of the black racial groups of Africa);

Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);

Portuguese (a person of Portuguese, Brazilian, or other Portuguese culture or origin, regardless of race);

Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands);

American Indian or Alaskan Native (a person having origins in any of the original peoples of North America); or

a member of another group, or other individual, found to be economically and socially disadvantaged by the Small Business Administration under 8(a) of the Small Business Act as amended (15 U.S.C. 637[a]).

The Department will furnish, upon request, a list of certified MBEs. This list shall not be construed as an endorsement of the quality or performance of the business, but is simply a listing of firms who are certified by the Department as being MBEs.

The Contractor is encouraged to use the services of banks owned or controlled by minorities or females; however, use of such services will not be credited toward participation achievement for the Contract. The Department has on file, and will make available on request, the names and addresses of known minority and female owned banks in the State of Virginia.

The Contractor shall designate and make known to the Department a liaison officer who is assigned the responsibility of actively and effectively administering, encouraging and promoting a responsive program for the use of MBEs.

The "performance of the Contract" for the purpose of this specification shall be interpreted to include, but not necessarily be limited to, subcontracting; furnishing materials, supplies, and services; and, leasing equipment.

If the Contractor intends to sublet a portion of the work on the project, the Contractor is encouraged to seek out and consider MBEs as potential subcontractors. The Contractor is encouraged to contact MBEs to solicit their interest, capability, and prices and shall retain on file the proper documentation to substantiate such contacts.

By signing the bid, the bidder certifies to the following:

- (1) That on the work proposed to be sublet and shown on the form for "Contractors Proposal to Sublet," the bidder has taken reasonable steps to seek out and consider MBEs as potential subcontractors.
- (2) That, if awarded the project, any work proposed to be sublet and not shown on the form for "Contractors Proposal to Sublet," the same reasonable steps certified under paragraph (1) herein will be taken.

If the Department has determined that specific opportunities for participation by MBEs are available on a particular Contract, such participation will be shown as a percentage of the Contract amount and will be indicated in the proposal on Form C-61, *Potential MBE Participation*.

If the bidder is an MBE which is owned and controlled by a minority female(s), participation achievement may be shown as either minority or female, but not both. Further, each bidder shall meet the requirements of Section 102.01 of the Specifications.

If the apparent low bidder is a currently certified MBE firm, the MBE requirements of this provision will not be applicable except for those referring to the reporting of participation achievement.

The Department has prepared a suggested list of the types of efforts that contractors are encouraged to make in soliciting MBE participation. Other factors or types of efforts may be relevant in appropriate cases.

The Department offers the following examples of efforts that may be considered. The Contractor is encouraged to:

- (1) attend any pre-solicitation or pre-bid meetings at which MBEs could be informed of contracting and subcontracting opportunities;
- (2) advertise in general circulation, trade association and minority-focus media concerning the subcontracting opportunities;
- (3) provide written notice to a reasonable number of specific MBEs that their interest in the Contract was being solicited in sufficient time to allow the MBEs to participate effectively;
- (4) follow-up initial solicitations of interest by contacting MBEs to determine with certainty whether the MBEs were interested;
- (5) select portions of the work to be performed by MBEs in order to increase the likelihood of obtaining MBE participation (including, where appropriate, breaking down contracts into economically feasible units to facilitate MBE participation);
- (6) provide interested MBEs with adequate information about the plans, specifications, and requirements of the Contract;

- (7) negotiate in good faith with interested MBEs, not rejecting MBEs as unqualified without sound reasons based on a thorough investigation of their capabilities;
- (8) make efforts to assist interested MBEs in obtaining bonding, lines of credit, or insurance required by the Department or Contractor;
- (9) make efforts to assist interested MBEs in obtaining necessary equipment, supplies, materials, or other necessary or related assistance or services; and,
- (10) effectively use the services of available minority community organizations; minority contractors' groups; local, state and federal minority business assistance offices; and other organizations that provide assistance in the recruitment and placement of MBEs.

Any agreement between a bidder and an MBE whereby the MBE agrees not to provide quotations for performance of work to other bidders is prohibited.

Within 14 days after the opening of proposals in accordance with Section 102.12, if the apparent low bidder, as read at the bid opening, is reporting participation achievement on the contract, he shall submit to the Department a fully executed Form C-61 showing the name(s) and certification number(s) of any currently certified MBEs who will perform work eligible to be reported as said participation credit.

The signatures on Form C-61 shall be those of authorized representatives of the bidder as shown on Forms C-37 and C-38A or as authorized by letter from the bidder.

If it is determined, subsequent to the bid opening, that the apparent low bidder as read at the bid opening has changed, the new apparent low bidder will be advised by letter and shall submit the information required herein within 14 days after the date of notification.

Any award made by the Board prior to receipt of the information required will be conditional, pending receipt of such information.

The Contractor shall furnish, and require each subcontractor to furnish, prior to final acceptance of the Contract, information relative to all MBE involvement on the project if such work is to be claimed as participation achievement and verification is available. The information shall be indicated on Form C-63, *D/MBE Activity Report*, and certified on Form C-63A, *D/BE/WBE Payment Certification*, or by copies of canceled checks with appropriate identifying notations. If participation achievement is with an MBE whose name has not been previously furnished, an initial or revised Form C-61, whichever is appropriate, shall be submitted prior to such MBE beginning the work. Failure to provide the Department the forms by the Contractor's semi-final estimate may result in delay of approval of the Contractor's estimate for payment.

If an MBE, through no fault of the Contractor, is unable or unwilling to fulfill his agreement with the Contractor, the Contractor shall immediately notify the Department and provide all relevant facts. If any subcontractor is relieved of the responsibility to perform work under their subcontract, the Contractor is encouraged to take steps to obtain an MBE to perform an equal or greater dollar value of the work. The substitute MBE's name, description of the work, and dollar value of the work shall be submitted to the Department on Form C-61 prior to such MBE beginning the work, if such work is to be counted for participation achievement.

APPENDIX E

	Rates	Fringes
BLASTERS	8.50	
CARPENTERS, STRUCTURE	10.09	
CONCRETE FINISHERS	10.00	
ELECTRICIANS	9.12	
FENCE ERECTORS	7.86	
FORM SETTERS	8.48	
GUARDRAIL ERECTORS	9.27	
LABORERS:		
Construction Workers II		
(Laborers)	6.91	
Construction Workers I		
(Skilled Laborers)	8.12	
Landscape Workers	7.13	
Asphalt Rakers	7.94	
Pipelayers	6.50	
PAINTERS	11.00	
PAINTERS, BRIDGE	11.00	
POWER EQUIPMENT OPERATORS:		
Asphalt Distributor Operators	8.11	
Asphalt Paver Operators	8.15	
Backhoe Operators	10.44	
Bulldozer Operators	8.97	
Bulldozer Operators, Utility	8.00	
Concrete Finish Machine/Screed		
Operators (Bridge)	12.00	
Concrete Finish Machine Operators,		

Utility	8.85
Crane, Derrick, Dragline	
Operators	11.50
Drill Operators	9.63
Excavator Operators	12.00
Front-End Loader Operators	
(2 yds. & under)	9.44
Front-End Loader Operators	
(Over 2 yds.)	10.56
Gradall Operators	14.00
Hydro-Seeder Operators	8.00
Mechanics	11.00
Motor Grader Operators	
(Fine Grade)	9.77
Motor Grader Operators	
(Rough Grade)	10.95
Pavement Planing Operators	8.38
Roller Operators (Rough)	8.66
Roller Operators (Finish)	7.81
Scraper Pan Operators	8.41
Stone Spreader Operators	8.25
Tractor Operators (Utility)	7.70
REINFORCING METAL WORKERS	8.07
STRUCTURAL WORKERS	9.00
TRUCK DRIVERS:	
Heavy Duty	8.44
Multi-Rear Axle	8.18
Tandem and Single	
Rear Axle	7.97

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

END OF GENERAL DECISION.

APPENDIX F

Appendix D

Permits

(Revised 09/15/03)

2.1 GENERAL

This section lists the most common and major permits needed for project development. It does not list all the permits that might be necessary for developing any particular project and is not meant to be all-inclusive. It is the Design Engineer's/Developer's responsibility to ensure that all applicable permits (whether listed in this section or not) are obtained.

Prior to commencing construction, all approvals including plan approval and all permits and easements shall be obtained and all required bonds posted. A preconstruction conference may be required prior to commencing any construction. A set of plans signed and approved by the City shall be maintained onsite at all times.

2.2 DRIVEWAY PERMIT (City of Lynchburg)

Any person desiring to cross the City sidewalks, curbs, or street right-of-way lines with such vehicle or machinery to enter any private premises, private roads, or alleys, shall make application to the City Engineer for a permit to construct a driveway across City property. Permit shall be obtained at the office of the City Engineer, Second Floor, City Hall. When such permit is granted, the persons securing such permit shall construct such crossing at their own expense of such material as specified in the latest City of Lynchburg Manual of Specifications and Standard Details and shall cause the curbing, if any, to be removed for the required width of the driveway in accordance with the latest City of Lynchburg Manual of Specifications and Standard Details applicable thereto.

The failure to exercise a driveway permit issued under the provisions of Article II – Driveways of the City of Lynchburg Code within 3 months after its date of issue shall automatically be revoked and a new permit must be obtained.

2.3 EXCAVATION PERMIT (City of Lynchburg)

No person shall excavate within the right-of-way of any street, sidewalk, alley or any other public right-of-way or thoroughfare in the City, for any purpose whatsoever, without first obtaining a permit to do so.

An excavation permit will be required for any utility company wishing to excavate or place utilities in City right-of-way. Permit shall be obtained at the office of the City Engineer, Second Floor. Pavement cuts in streets made by private utilities or City forces shall be repaired in accordance with specification Section 02220 – *Trenching, Backfilling & Compaction of Utilities*, as well as **Standard Details 25.18** through **25.22**, as applicable.

2.4 LAND DISTURBING PERMIT (City of Lynchburg)

No person shall engage in any land disturbing activity until he has acquired a land disturbing permit, paid the applicable fees, and posted the required bonds, unless the proposed activity is specifically designated as exempt by the City's plan approving authority.

The Design Engineer/Developer shall be responsible for obtaining the proper erosion control permit from the City of Lynchburg Community Planning & Development Department, Second Floor, City Hall of Lynchburg, Virginia or the State ESC program should the land disturbing activity take place on State land.

2.5 BURNING (City of Lynchburg)

Unless otherwise exempted, no person shall engage in any burning activity within the corporate limits of the City of Lynchburg without first obtaining a permit and paying the applicable fees. Permit shall be obtained from the Office of the City of Lynchburg Fire Marshall. The requirements and limitations for burning can be found in the appropriate chapter(s) of the City of Lynchburg Municipal Code.

2.6 BLASTING (City of Lynchburg)

No blasting will be permitted within the corporate limits of the City of Lynchburg without first obtaining a permit and paying the applicable fees. Permit shall be obtained from the Office of the City of Lynchburg Fire Marshall. The requirements, limitations, and necessary credentials for blasting within City limits can be found in the appropriate chapter(s) of the City of Lynchburg Municipal Code, Section 01000 – *General Requirements* in the City of Lynchburg Manual of Specifications & Standard Details, and the blasting permit itself.

2.7 US ARMY CORPS OF ENGINEERS PERMIT

Existing ponds, streams, ditches, etc. that are depicted on current soils and USGS maps and wetlands are potentially monitored and controlled by the USCOE. The Design Engineer/Developer will be required to provide proper notification and submittal of application for permitting (if required) prior to disturbance of these features. If a permit is required from the USCOE, forward a copy of the approved permit to the City. If the features are present and a permit is not required, forward a letter stating the exemption and acceptance by the USCOE that the disturbance is an exempted activity and a permit is not required. In either situation, the permit or letter shall to be submitted to the City of Lynchburg City Engineer prior to the commencement of construction activity.

2.8 RAILROAD PERMIT

Contact the appropriate railroad company when encroaching on any railroad right-of-way. If the railroad company requires a permit for the proposed construction activity, the permit shall be filed and approved with a copy of the approved permit forwarded to the City of Lynchburg City Engineer prior to commencement of construction activity.

2.9 VDOT PERMITS

The following permits (if required) will need to be approved and submitted to the City of Lynchburg City Engineer prior to commencement of any construction activity:

2.9.1 DRIVEWAY PERMIT

A VDOT driveway permit will be required for residential driveways, commercial driveways, and street connections/entrances to a subdivision and to a commercial or industrial park, which ties into an existing street that is owned and maintained by VDOT. A copy of the approved permit shall be forwarded to the City of Lynchburg City Engineer prior to the commencement of construction activity.

2.9.2 ENCROACHMENT PERMIT

Any construction that is proposed within the VDOT right-of-way will require an encroachment permit to be issued and approved by VDOT. The appropriate encroachment permit shall be used for the project and a copy of the approved permit shall be forwarded to the City of Lynchburg City Engineer prior to the commencement of construction activity.

2.10 DEQ PERMITS

If the proposed construction activity will produce pollution, has the potential to be hazardous, involves filling of waterways or includes surface water or ground water withdrawal, the activity may require a permit from the Department of Environmental Quality (DEQ). The Design Engineer/Developer shall obtain the proper permits from DEQ for the construction activity. The following permits are issued from DEQ:

- Air Permit
- Water Permit
- Waste Permit
- Virginia Marine Resources Commission (VMRC) Permit

Forward a copy of the approved permit(s) to the City of Lynchburg City Engineer prior to the commencement of construction activity.

2.11 BUILDINGS – CERTIFICATE OF OCCUPANCY

Prior to the issuance of a certificate of occupancy for any dwelling, a City Construction Coordinator's certification of acceptance must be received by the City Engineer for any associated water, sewer, and road extensions stating that the construction conforms substantially to the approved plans and specifications.

Supplement to Permits, 2.10 DEQ Permits:

Last sentence in first paragraph shall read:

The **Contractor** shall obtain the proper permits from DEQ for the construction activity.

APPENDIX G

Kemper Station Bike/Hike Trail

City Project No. 98096-M

VDOT Project No. EN97-118-113, C-502

EROSION AND SEDIMENT CONTROL NARRATIVE

Project Description

Approximately four acres will be disturbed by the construction of this bike/hike trail. 2,500 lf follows the abandoned rail bed; 850 lf is new construction; 2,437 lf parallels the railroad and goes through Public Services compound.

Existing Site Conditions

The majority of the trail finishes are applied to surfaces already to grade, either along an abandoned rail bed or through Public Services compound as graded when the Fleet Services building was constructed. The abandoned rail bed and Public Services will have minimal or no grading; existing ditches and culverts will be cleaned to maintain positive drainage away from the trail. The area of new construction is delineated by cut and fill construction limits and is as shown on Sheet 8X of the plans.

Adjacent Areas

Construction is limited to the abandoned rail bed and Public Services area, all on property owned by the City of Lynchburg.

Off-site Areas

Construction will be contained on site. Contractor has been asked to provide unit price for off-site borrow material should the approach to Park Avenue require additional fill (City surplus construction material has previously been placed to bring area to grade). Contractor shall be responsible for off-site borrow origin, approved erosion and sediment control plan, and related erosion and sediment control measures.

Soils

TIE2—Tatum loam is predominate soil classification as shown in the Soil Survey of Campbell County and City of Lynchburg, Virginia. Tatum loam is a clay and silt loam with mica schist or quartz sericite schist. Fair trafficability, moderate soil moisture, clayey subsoil with moderate shrink-swell potential and medium to high compressibility.

Critical Areas

Critical area is from Sta. 124+00 to Sta. 132+50 (0.9 acres) where trail is graded for switchback and change in elevation. E&SC measures are designated and contractor's responsibility to place and maintain properly.

Erosion and Sediment Control Measures

All areas disturbed by construction and not to received asphalt shall be fine graded, seeded, and mulched according to the Virginia Erosion and Sediment Control Handbook. All E&SC measures shall be responsibility of contractor to properly place and maintain. Items used shall be Silt Fence, Permanent Seeding, Mulching, and Vegetation. Following the one-year warranty period of construction, the trail shall be maintained by City forces.

Permanent Stabilization

Refer to Table 3.32-D, Site Specific Seeding Mixtures for Piedmont Area, general slope or low maintenance slope (copy attached).

Storm Water Run-off Considerations

Existing swales and proposed ditches will direct slope runoffs; existing and proposed pipes shall direct water beneath trail; minimal overtopping is allowed. Center crown and grade directs surface flow.

Calculations

The trail bed is prepared and in place with exception of Critical Area. Pipes are sized for ten year runoff.

Sta. 120+83

Contributing area = 1.9 acres

Slope of proposed 15" dia. pipe @ 2.5%

$L=250$ ft.; $c=0.3$; Overland slope @ 17%; $T_c=13.5$; $i=5.0$

$Q=cia=0.3(5.0)(1.9)=2.85$ cfs

2.5% pipe slope – 9" dia req'd – 15" dia. provides 10 cfs capacity

Sta. 126+93

Contributing area = 4.0 acres

Slope of proposed 15" dia. pipe @ 5.0%

$L=100$ ft.; $c=0.3$; Overland slope @ 25%; $T_c=9$; $i=5.9$

$Q=cia=0.3(5.9)(4)=7.08$ cfs

5.0% pipe slope – 11.5" dia req'd – 15" dia. provides 14 cfs capacity

Bond Amount

E&SC measures are estimated at \$40,000.

TABLE 3.32-D
SITE SPECIFIC SEEDING MIXTURES FOR PIEDMONT AREA

	<u>Total Lbs.</u> <u>Per Acre</u>
<u>Minimum Care Lawn</u>	
- Commercial or Residential	175-200 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	95-100%
- Improved Perennial Ryegrass	0-5%
- Kentucky Bluegrass	0-5%
<u>High-Maintenance Lawn</u>	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	100%
<u>General Slope (3:1 or less)</u>	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	<u>20 lbs.</u>
	150 lbs.
<u>Low-Maintenance Slope (Steeper than 3:1)</u>	
- Kentucky 31 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop *	20 lbs.
- Crownvetch **	<u>20 lbs.</u>
	150 lbs.

* Use seasonal nurse crop in accordance with seeding dates as stated below:

February 16th through April	Annual Rye
May 1st through August 15th	Foxtail Millet
August 16th through October	Annual Rye
November through February 15th	Winter Rye

** Substitute Sericea lespedeza for Crownvetch east of Farmville, Va. (May through September use hulled Sericea, all other periods, use unhulled Sericea). If Flatpea is used in lieu of Crownvetch, increase rate to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may be added to any slope or low-maintenance mix during warmer seeding periods; add 10-20 lbs./acre in mixes.

APPENDIX H

ORDER NO.:
CONTRACT ID. NO.:

Form C-104
Rev. 12-9-99

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION



PROJECT:

FHWA:

This form must be completed, signed and returned with bid; and failure to do so may result in the rejection of your bid. **THE CONTRACTOR SHALL AFFIRM THE FOLLOWING STATEMENT EITHER BY SIGNING THE AFFIDAVIT AND HAVING IT NOTARIZED OR BY SIGNING THE UNSWORN DECLARATION UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES.** A SEPARATE FORM MUST BE SUBMITTED BY EACH PRINCIPAL OF A JOINT VENTURE BID.

STATEMENT. In preparation and submission of this bid, I, the firm, corporation or officers, agents or employees thereof did not, either directly or indirectly, enter into any combination or arrangement with any persons, firm or corporation or enter into any agreement, participate in any collusion, or otherwise take any action in the restraint of free, competitive bidding in violation of the Sherman Act (15 U.S.C. Section 1) or Article 1.1 or Chapter 12 of Title 18.2 (Virginia Governmental Frauds Act), Sections 59.1-9.1 through 59.1-9.17 or Sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.

AFFIDAVIT

The undersigned is duly authorized by the bidder to make the foregoing statement to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this ____ day of _____, 20 ____
County (City), STATE

(Name of Firm) By: _____ Title (print)
(Signature)

STATE of _____ COUNTY (CITY) of _____

To-wit:

I _____, a Notary Public in and for the State and

County(City) aforesaid, hereby certify that this day _____

personally appeared before me and made oath that he is duly authorized to make the above statements and that such statements are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20 ____

My Commission expires _____

Notary Public

OR
UNSWORN DECLARATION

The undersigned is duly authorized by the bidder to make the foregoing statement to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this ____ day of _____, 20 ____
County (City), STATE

(Name of Firm) By: _____ Title (print)
(Signature)

**ORDER NO.:
CONTRACT ID. NO.:**

Form C-105
Rev. 12-9-99

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
AFFIDAVIT**



PROJECT:

FHWA:

This form must be completed, signed, notarized and returned with bid; and failure to do so, may result in the rejection of your bid. A separate form must be submitted by each principal of a joint venture bid.

1. I, the firm, corporation or officers, agents or employees thereof have neither directly nor indirectly entered into any combination or arrangement with any person, firm or corporation or entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract, the effect of which is to prevent competition or increase the cost of construction or maintenance of roads or bridges.

During the preceding twelve months, I (we) have been a member of the following Highway Contractor's Associations, as defined in Section 33.1-336 of the Code of Virginia (1970). (If none, so state).

NAME	Location of Principal Office
<hr/>	<hr/>
<hr/>	<hr/>
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2. I (we) have _____, have not _____, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that I/We have _____, have not _____, filed with the joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Note: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor [41 CFR 60-1.7(b)(1)], and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contract or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contract and subcontract unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

(Continued)

ORDER NO.:
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3. The bidder certifies to the best of its knowledge and belief, that it and its principals:
- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offence in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated above; and
 - (d) Where the bidders is unable to certify to any of the statements in this certification, the bidder shall show an explanation below.

Explanations will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any explanation noted, indicate below to whom it applies, initiating agency, and dates of action. Providing false information may result in federal criminal prosecution or administration sanctions. The bidder shall provide immediate written notice to the Department if at any time the bidder learns that its certification was erroneous when submitted or has become erroneous by reason of change circumstances.

The undersigned is duly authorized by the bidder to make the foregoing statements to be filed with bids submitted on behalf of the bidder for contracts to be let by the Commonwealth Transportation Board.

Signed at _____, this ____ day of _____, 20 ____
County (City), STATE

By: _____
(Name of Firm) (Signature) Title (print)
STATE of _____ COUNTY (CITY) of _____
To-wit:

I _____, a Notary Public in and for the State and
County(City) aforesaid, hereby certify that this day _____
personally appeared before me and made oath that he is duly authorized to make the above statements
and that such statements are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20 ____
My Commission expires _____

Notary Public

COMMONWEALTH OF VIRGINIA
VIRGINIA DEPARTMENT OF TRANSPORTATION
MINIMUM DBE REQUIREMENTS

PROJECT NO: _____

FHWA NO: _____

***** INSTRUCTIONS *****

Section II of this form is to be used by the Contractor to submit the names of DBE firms to be utilized on the project. Additional sheets to show the allowable credit per item may be attached if necessary. **Note:** If 100% of an item is not to be performed or furnished by the DBE, describe the portion and percentage to be performed or furnished by the DBE.

SECTION I:

DBE REQUIREMENT _____ %

SECTION II:

PERCENTAGE ATTAINED BY BIDDER _____ %

NAME(s) AND CERTIFICATION NO. OF DBE(s) TO BE USED	TYPE OF WORK & ITEM NO(s)	PERCENT OF WORK	AMT. OF ALLOWABLE CREDIT PER ITEM
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

TOTAL: \$ _____

Total Contract Value \$ _____ X Required DBE _____ % = \$ _____

I/WE certify that the proposed DBE(s) submitted will be used on this contract as stated hereon and assure that during the life of the contract, I/We will meet or exceed the participation established hereon by the Department.

BIDDER By _____
SIGNATURE

TITLE DATE